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**A SKETCH OF
MEDICINE *AND* PHARMACY**

BY

S. E. MASSENGILL, M.D.



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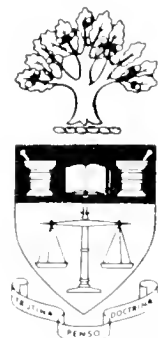
SKETCH OF MEDICINE AND PHARMACY

AND A VIEW OF ITS PROGRESS
BY THE MASSENGILL FAMILY
FROM THE FIFTEENTH TO THE
TWENTIETH CENTURY



By

Samuel Evans Massengill, M. D.



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There is no pretense to any original investigation in the history of medicine, nor to any consultation of original documents. I have selected what seemed to be fitting from well-known biographies, monographs, and from standard histories.

"And if so be any man object unto me that this discourse is only compiled together of certayne rapsodyes of the antique Chyrurgians, I willingly heere confes and acknowledge that in this Treatise there is verye little, or nothing at all, of myne own Invention."

—Jacques Guillemeau
A. D. 1594.

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INTRODUCTION

Antiquity means ancient or obsolete, and when it is applied to physicians it refers to those who practiced in a misty, distant age. The term usually refers back to the doctors of Egypt, or even Babylon, or early Asiatic countries. But it is a wrong assumption to look upon the physicians of those countries as obsolete.

The history of medicine may be divided into three periods or ages, to be denominated respectively:

- I. The Mythological;
- II. The Dogmatic or Empirical; and,
- III. The Rational

The Mythological age extends from the infancy of the human race to about the year 400 B. C., and includes what is known from tradition of the early evolution of medicine, together with the meager facts gained from history during this interesting epoch.

The history of medicine really begins with the Dogmatic or Empirical age, and includes that portion of the time between the Hippocratic period (400 B. C.) and the close of the eighteenth century, A. D., or the death of the last Dogmatic system, the Brunonian.

The Rational age in medicine begins where dogmatism leaves off; viz., about the close of the eighteenth century and the beginning of the nineteenth. It is founded upon the ruins of the ancient dogmatic schools, together with the new facts discovered about this time by the rapid evolution of anatomy, physiology, pathology, chemistry and the collateral sciences. The latter two ages are necessarily more or less blended, and seem to overlap each other.

When history dawned, we find therapeutics well advanced as a science. The Assyrians, Babylonians, and Egyptians had well-established drug stores, which were used as clinics by the leading doctors of the various cities and villages. They had well-written books on materia medica which gave valuable descriptions of several hundred drugs, their preparation and uses.



MEDICINE IN THE STONE AGE

CHAPTER I

The history of the physician begins with the dawn of humanity, as disclosed by the fossil records. The great lesson yielded by examinations of the earliest bones of fossil men is that they were subjected to the same accidents and diseases as we are.

The practice of medicine is the oldest and most esteemed of the professions. Primitive man, hundreds of thousands of years ago, was attended in his sickness by men who were expert in medicine.

Before the priest, politician, and lawyer began their practices, the doctor pursued his noble calling and exercised the principal power in his community.

Man learned the practice of medicine at an early age in his development by watching the curative powers of nature, and the practices of animals and birds.

Finger, arm, and other amputations were performed with crude flint instruments. The early Stone Age surgeon was particularly skilled in setting fractures. LeBaron studied the skeletons of eighteen men who had fractured limbs, and found only three had healed badly.

Looking backward, the life of primitive man appears simple to us, but he was probably sufficiently occupied in keeping himself alive. At any rate, he was either not fastidious, or his women had not learned the art of housekeeping, for the floors of his caves were never swept. With the passing generations, layers of debris were covered with accumulating layers, but what was rubbish then is archeology now.

Primitive man himself is depicted as straight and slender, but he liked his women round, and thus the pendulous breasts and overdevelopment of the buttocks were due not only to too much cave-life and too much meat, but to selection.

Rock-shelters and caves were plentiful in those days. In the hills of Ariege, France, is a cavern called The Grotto of the Three Brothers. Some twenty or thirty thousand years ago it sheltered a tribe of those primitive men called Cro-Magnon. Traces of their sojourn still remain after all of the thousands of years that have passed since the dissolution of the tribe; bones and knives, tools and weapons, left in that dry stone cave, have been preserved. There is pictured there the first known representation of a physician, the tribal medicine-man. He is shown clothed in the skin of a deer, and he bears upon his head the antlers of that animal.

The first weapon in the hands of the first surgeon was a flint, and trepanning for the release of demons is the earliest surgical operation of which any evidence remains. Skulls bear witness to what was done aeons before the dawn of civilization.

They also practiced bleeding and the kindred practices of cupping, leeching, and scarifying. All are varieties of blood-letting and are based on the theory that a demon is causing pain or swelling and an exit must be provided if the patient is to be relieved. Also, there are evidences of cauterization.

The surgery of this period began in mystery and magic. Medicine and religion have marched down the centuries hand in hand. For hundreds and thousands of years, the medical man was also a priest and magician. Medicine and chemistry are really the offspring of magic. In primitive societies today the doctor is considered to be a magician.

If people believe that disease is caused by malign spirits, they usually assume that the way to cure it is to use some form of magic which will appease the evil spirits or frighten them away from the body they have attacked. Today, the carrying of a horse chestnut to ward off rheumatism, the wearing of a bag of camphor around the neck to avoid influenza, and superstitions in regard to horseshoes and the rabbit's foot are survivals of the ages of magic.

The following is found in Burton's *ANATOMY OF MELANCHOLY*:

"Amulets and things to be borne about I find prescribed, taxed by some, approved by others. Look for them in Mizaldus, Porta, Albertus, etc. A ring made with the hoof of an ass's right forefoot, carried about, etc. I say, with Renodeus, they are not altogether to be rejected. Piony doth help elipepsies. Pretius stones most diseases. A wolf's dung carried about helps the cholick. A spider an ague, etc. Such medicines are to be exploded that consist of words, characters, spells, and charms, which can do no good at all, but out of a strong conceit, as Pomponatious proves, or the devil's policy, that is the first founder and teacher of them."

Quackery is closely associated with magic. This appears to be because the human mind prefers delusions to truth, fallacies to realities.

MEDICINE IN ANCIENT EGYPT

CHAPTER II

Egypt was the medical center of the ancient world. The Biblical admission, "And Moses was learned in all the wisdom of the Egyptians," indicates the origin of Mosaic magic. The medical history of Egypt, in early times, is really the history of all the peoples having contact with the Egyptians, because the Egyptians were a people ever alert to copy all which they found admirable in other peoples. From the remains of papyri, from stone tablets and various other inscriptions on monuments and tombs, it has been definitely determined that Egyptian medicine was largely a discipline established under the authority of the gods.

By the time the Egyptians began to write about medicine, the art was so old that they either forgot or ignored its crude beginnings, and preferred to attribute its origin to the gods. They could not eliminate magic from their medicine, or divorce their sacred and secular knowledge. All diseases were regarded as caused by the displeasure of the gods, and of course, according to that view of their pathology, they could be cured in no other way than by appeasing this displeasure, and no other means could be employed by the multitude in order to approach these gods, than through the medium of the priests who administered in the temples. The sick were bewildered with imposing rites and ceremonies. They used venesection, cathartics, emetics and clysters. They claimed to have been taught venesection by the hippopotamus, which, it is said, performed this operation upon itself by striking its leg against a sharp reed and opening a vein in this way, and after the blood had flowed as long as it thought proper filled the wound with mud. They also claim to have learned the use of clysters from their sacred bird, Ibis, which is said to have administered them to itself with its bill.

According to Herodotus there was in Egypt a special physician for every part of the body. They were thoroughly conversant with such ordinary hygienic measures as baths, massage and inunctions; they studied foods from the point of view of health, appreciated the role played by vermin in disease and practiced fumigation as a means of offsetting epidemics.

Mythology was well developed in Assyrian times, and in Babylonia and Egypt as well, the gods are often referred to in the medical literature. The gods of medicine were developed from outstanding surgeons and physicians, just as the Greeks deified Asklepios, a remarkably bold and successful surgeon, and made him supplant Jove as god of medicine.

There is a remarkable case of this character in Egypt, a country which was always famous for its medical arts and medical schools. Imhotep, or Imouthis, was elevated to be the god of medicine. He was said to be a son of Ptah, of the great triad Ptah-Seket-Osiris, the gods of heaven and earth. Imhotep means the man who comes in peace.

There are many references in the works of romance writers, to the capacity of Imhotep to send people suffering from pain to sleep. This, apparently, refers to his ability to place sick people under anesthetics, and indicates that Egyptian physicians were familiar with anesthetic agencies.

As the good physician both of gods and men, Imhotep cured their ailments while they lived, and in the cases of men, he cared for the preservation and embalming of their bodies at death.

Egyptologists who have studied the history of the god Imhotep believe that he was originally a very eminent and skilled physician, whose memory after his death was so wisely and favorably kept, that he eventually was elected to be a god. He appears, also, to have had something of importance to do with the embalming processes and with drugs. This indicates that he was a broadly-learned man—a surgeon, physician, and druggist. His knowledge, too, was great, and there is no doubt that the doctor possessed an unusually broad knowledge of drugs, spices, chemicals, and bandaging materials. He is depicted as bald, but the Egyptians did not like baldness and treated the condition vigorously. Heru-tata was one of the most learned scholars of the earlier settlers in Egypt, and the coupling of his name with that of Imhotep suggests that the god of medicine practiced on the Nile at the time of the earliest Egyptian settlements.

PAPYRI

The Veterinary and Gynecological Papyri from Kahun are the oldest yet discovered, dating back 2160-1788 B. C.

The Surgical Papyrus written about 1600 B. C., is over fifteen feet in length, and originally was longer.

The Book on Surgery and External Medicine, while copied 3500 years ago, actually reveals Egyptian medicine as it was practised 4500 years ago.

Among the papyri preserved in various museums a number of medical and pharmaceutical records have been found. Some medical prescriptions inscribed on a papyrus in the British Museum (No. 10,059) are said to be as old as the time of Khufu (Cheops), reckoned to have been about 3700 years B. C.

The most complete information of the medicine and pharmacy of ancient Egypt is contained in the famous Papyrus Ebers, which was discovered by Georg Ebers, Egyptologist, in 1872-3. The date is about the year 1552 B. C.

Among the drugs named in the papyrus and identified are oil, wine, beer (sweet and bitter), beer froth, yeast, vinegar, turpentine, various gums and resins, figs, sebestens, myrrh, mastic, frankincense, opium, wormwood, aloe, cummin, peppermint, cassia, carraway, coriander, anise fennel, saffron, sycamore and cyprus woods, lotus flowers, linseed, juniper berries, henbane, and mandragora.

Iron, lead, magnesia, lime, soda, nitre and vermillion are among the mineral products which were then used in medicine.

To prevent the immoderate crying of children a mixture of the seeds of the plant Sheben with some fly-dirt is recommended. It is supposed that Sheben may have been the poppy. Incidentally it is remarked that if a new-born baby cries "ny" that is a good sign; but it is a bad sign if it cries "mbe."

To prevent the hair turning grey anoint it with the blood of a black calf which has been boiled in oil; or with the fat of a rattlesnake. When it falls out one remedy is to apply a mixture of six fats, namely those of the horse, the

hippopotamus, the crocodile, the cat, the snake, and the ibex. To strengthen it anoint with the tooth of a donkey crushed in honey.

Medicines against worms are numerous.

The animal drugs included lizards' blood, swine's teeth, putrid meat, stinking fat, moisture from pigs' ears, milk, goose grease, asses' hoofs, animal fats from various sources, excreta of various animals, including human beings, donkeys, antelopes, dogs, cats, and even flies.

Seven hundred remedies are mentioned in this papyrus, and some of these drugs are serving mankind today: opium, castor oil, acacia, squill, calamus, coriander, hyoscyamus, saffron, colchicum, gentian, pomegranate and olive oil, and the salts of various metals.

Some of the prescriptions of the Ebers Papyrus are very simple. In those for purges they used a mixture of milk, yeast, and honey, or pills compounded of honey, wormwood, and onion. For headache there was used a prescription calling for frankincense, cumin, u'an berries (unidentifiable), and goose grease, which were to be boiled together and used as an external application.

There is one headache remedy attributed to divine origin (Isis having prescribed it for Ra's headache), which contains coriander, wormwood, juniper, honey, and opium.

As a prescription for a tonic there is recommended a preparation made by compounding figs, Assyrian plums, grapes, frankincense, cumin, wine, beer, yeast, and goose grease.

A prescription, annotated as having been prepared for Schesch (a queen of the third dynasty), consisted of equal parts of the heel of an Abyssinian greyhound, of date blossoms, and of asses' hoofs, boiled in oil. This was for the purpose of making the hair grow.

MUMMIFICATION

The Egyptians astonish us with the lost art of mummification. Mummification failed in its principal object, but it exerted a powerful influence on medicine and surgery, and laid the foundation of anatomy and biology. It has been shown on Egyptian mummies that these ancient people suffered and died from modern diseases such as arteriosclerosis and nephritis.

Egyptian medicine was non-progressive; therefore, it went backward with the centuries. The earlier papyri contain less magic and more medicine, while in the later scrolls the incantations are predominant. The Egyptians did not fully take advantage of the opportunities to leave a scientific legacy to posterity, for during the many centuries they eviscerated millions of their dead they learned no pathology, and their mummies are evidence of badly united bones and abscessed teeth.

Sekhetananch, the first physician mentioned in history, is but a name, Imhotep is a semi-myth, and we know nothing of their thoughts or methods. However, Egyptian surgeons have rather significant accomplishments to their credit. They bandaged well, cupped and venesected, practised circumcision and castration, developed men particularly skillful in cutting for bladder stones (lithotomists) and in performing amputations. There were among them ophthalmic surgeons and dentists and clever artificers of surgical instruments.

MEDICINE IN ANCIENT GREECE

CHAPTER III

The outstanding eminence of Greece in medicine and surgery has led many to believe that modern medicine was founded in Greece. That, however, is a pure fallacy. Medicine and surgery were both inherited in a high state of development. They came to Greece through a long line of other civilized peoples from a remote antiquity. The early history of Greek medicine, like that of political developments, is lost in mythology.

In the early days it must have been primitive, as at the beginning of every civilization—a mixture of religion, magic, and empirically acquired ideas and practises.

The Persians, Indians, Chinese, and other Asiatic peoples were just as much advanced in surgery, medicine, chemistry, and therapeutics as the Assyrians, Babylonians, and Egyptians. All these peoples united their medical knowledge and placed it in the hands of the Greeks to be polished and presented to us.

Ancient Greece was largely colonized by the Egyptians. These colonists brought their deities and their worship along with them, and consequently the mythology of the Greeks was largely borrowed from the Egyptians; and especially was this the case with medical divinities.

AESCULAPIUS

Aesculapius was likely a skillful physician, but just as the Egyptian Imhotep, who was originally an historical personage, in time evolved into a deity, so Aesculapius developed into the Grecian god of medicine.

So great, as the Greeks believed, was the power of Aesculapius over disease, so wonderful were the cures which he accomplished, and so noble and pure his character, that they not only made him a god, but erected temples in his honor.

Instruction in medicine was given in the Temple of Aesculapius. This instruction was oral, since there were no written medical works among the Greeks before the fifth century before Christ.

According to legends, Aesculapius suffered many vicissitudes in his early life. By one tale he was said to be the son of Coronis and Apollo, and was saved at birth only by taking him from his mother's womb as she was brought to her funeral pyre. According to another tale his mother was Ascinoe and, while there were no difficulties in the matter of his birth, he was abandoned as an infant, but was saved from starvation by a goat. Aesculapius survived his stormy childhood and lived to marry twice. He was the father of the damsels Hygeia and Panacea, often described as allegorical figures, Hygeia representing health, and Panacea, medicine. The mother of Hygeia was a daughter of his first wife. Hygeia is present in its various forms, such as hygiene, hygienic, and hygienist. His second wife was Lampetia, a daughter of the sun-god.

He was a student of Chiron the centaur, who is said to have established the first medical college mentioned in history, in a cave or grotto at the foot of Mount Pelion, where he taught medicine, music, botany and chirurgery.

Aesculapius grew to manhood in Thessaly, learning from his wise tutor (half man, half horse) which plants had healing virtues, and many a charm could cure illness. Thus he became a physician, greatly sought after.

Aesculapius distinguished himself above all others as surgeon-in-chief of the expedition of Argonauts in search of the golden fleece, and his fame has been celebrated in poetry, more as a surgeon than as a physician. One of his principal medicines appears to have been a mixture of wine, meal and scraped cheese made from goat's milk.

Aesculapius' death has been attributed to two different causes. First, after he had restored Hippolytus to life, instead of a reward, incurred destruction by fire at the hands of Zeus because his professional skill excited the wrath of that jealous god. Second, Pluto complained to Zeus that the prolongation of life on the earth, due to the ministrations of Aesculapius, was keeping down the population of Hades. Zeus, to restore the balance of population, slew Aesculapius with a thunderbolt.

HIPPOCRATES

Hippocrates was born on the Island of Kos about 460 B. C., and graduated from the school of Kos and received his medical training in the hospital where his father, Heraclides, was a surgeon. It is claimed that his father, Heraclides, was a direct descendant of Aesculapius, and that his mother, Phenarita, was of the family of Hercules. He also studied under a prominent doctor named Herodicos of Cnidos.

The history of Dogmatic or Empirical medicine, as transmitted to us in a direct line, begins with Hippocrates and his followers. All our information prior to this date partakes largely of the prehistoric or mythological.

Medicine existed for centuries before him, and Hippocrates himself wrote a treatise entitled ON ANCIENT MEDICINE, but we properly call him the Father of Medicine. Everything that had been learned before Hippocrates has perished; and, curiously, there exists a great gap after him as well as before him, so that the writings of Hippocrates remain isolated amongst the ruins of ancient medical literature. His knowledge of medicine was so great that it is suggested that his writings represent the remains of the medical library of Cos.

The great contribution of Hippocrates was medical diagnosis. It was he who established firmly the principle that the knowledge of disease rests primarily upon the careful observation and notation of symptoms. It is questionable whether, all things considered, a more subtly critical clinical mind than his has ever graced the art of medicine.

He separated medicine from religion and philosophy, and made it an independent subject.

Hippocrates flourished when nothing or next to nothing was known of anatomy, physiology, or pathology. Chemistry was yet an unborn science. Not a single trace of chemistry as applied to pharmacy can be found previous to or during the time in which Hippocrates lived. Little was known of botany; especially of the medicinal properties of plants.

Some of Hippocrates' divisions of diseases have scarcely been modified, and words spoken by physicians daily, in the present age, are found in his

writings, with the same meanings as at present; such as acute and chronic; epidemic, endemic and sporadic; malignant and benign, crisis, and so on.

Dislocations of the hip, shoulder, and jaw are described exactly in the Hippocratic works and treated almost as we would treat them today, except that an anesthetic was not used.

Among the diseases treated are pneumonia, pleurisy, malaria, tuberculosis, wounds, bites of serpents, and occasional epidemics. Catarrhs, gout, dysentery, and lung diseases only came with luxury.

In writing of the consumptives, he says, "Many, and in fact, the most of them, died; and of those confined to bed, I do not know if a single individual survived for any considerable time." Of the forty-two case-histories detailed, twenty-five end in death.

Of Hippocrates as an individual it may be said that he was the embodiment of all that a physician should be. He was a close observer, a humane scholar, and a man filled with the desire to help his patients and to ensure that by his teaching and experience others should benefit. High ideals are set forth simply in the Hippocratic oath. This oath has been respected by physicians and surgeons of every race and creed for two thousand years.

The treatise ON THE PROGNOSTICS will always be famous for the Hippocratic description of the signs of approaching death which we still call *facies Hippocratica*: nose sharp, eyes hollow, temples sunken, ears cold and contracted with their lobes turned outward, skin tense and parched, face discolored, eyelids livid, mouth open, lips loose and blanched.

There are many fables and anecdotes designed to show how great a physician was Hippocrates, for example:

Wandering from place to place, he traversed the whole of Greece, and his cures aroused general astonishment. The king of Macedon fell sick, and his doctors believed him to be consumptive. Hippocrates was called in consultation with Euryphon, the court physician, and recognized that the king's illness was not consumption but was what we should now call psychogenic—of mental causation. The philosopher Democritus had become insane, and the people of Abdera sent for Hippocrates to cure him, and also to free their city of the plague. In Athens, too, pestilence was raging. Hippocrates appeared upon the scene and noticed that the smiths were immune. Fire, then, must be a remedy, and Hippocrates had huge bonfires kept burning until the epidemic abated.

A swarm of bees is said to have settled near his tomb; the honey from this hive was reputed to possess remedial virtues for centuries thereafter. This was an example of reversion to type, for Hippocrates himself would not have countenanced such a superstitious belief.

GALEN

Claudius Galen was born in Pergamos, Greece, in 130 or 131 A. D., and is said to have died in the same city between 200 and 210 A. D.

He received instruction from distinguished teachers in both the Dogmatic and Empiric schools and undertook the task of reforming medicine. He claimed in the beginning of his career to be an Eclectic, but soon proved himself to be the most bigoted and intolerant of Dogmatics.

From the body of medical writings then available, he took whatever seemed good to him. If he recognized any master, it was the founder of the healing art, Hippocrates. The Galenic system of medicine, thus established by the practical skill of its founder upon the most accessible materials which intelligent zeal could use, was servilely followed throughout the Middle Ages.

Galen was a genius, a born physiologist, a brilliant exponent of experimental methods, and a first-class anatomist. His system of anatomy was accepted by the entire civilized world, until the time of Vesalius.

Galen, the best-educated and most gifted physician of the second century—and of the centuries to come—could not be content in the provinces or in fallen Alexandria; therefore, as a stranger he entered Rome, 162 A. D.

Galen was always conscious of his own abilities and his own superiority in learning; he was always burning with ambition and hopeful for grander fields for his activities, and there was a weakness in his character which he appears to have been quite unaware of and which always handicapped him. It was his irascibility. This narrowed his vision, and, as all his writings show, constantly kept him in a combative mood. Pugnacity, and a strong desire to criticize other medical writers, are plainly featured in all his writings. Speaking of his parents, Galen wrote:

"I was blest with a calm, just, gallant, and sympathetic father, whereas my mother was of so irritable a temper that she would at times bite her maids, and was forever screaming and quarreling with my father, worse than Xanthippe with Socrates."

Galen was not only a strongly critical writer, but a boastful and conceited doctor, as his recital of his conversation with Marcus Aurelius, his patient, bears witness:

"This diagnosis called forth his praise, and he thrice repeated: 'Yes, that is it; it is exactly as you say; I feel that cold food is disagreeing with me'.

"He then asked me what was to be done. I answered him frankly that if another than he had been the patient, I should have, following my custom, given him wine with pepper.

"'With Sovereigns like yourself, however, doctors are in the habit of employing the least drastic remedies, therefore it must suffice to apply upon the abdomen wool with warm spikenard.'

"The Emperor replied that warm ointment on purple wool was his usual remedy for pain in the stomach, and called Dr. Peitholaos to apply it and let me go. This being done, and his feet warmed by rubbing with heated hands, he demanded Sabine wine, threw pepper into it and drank, after which he said to Dr. Peitholaos that now, at last, he had a physician and a courageous one, repeating that I was the first of physicians and the only philosopher."

The following quotations illustrate the varying opinions of Galen:

"They called him Paradoxologos, and Logiatros, which meant that he was a boaster and a master of phrases. It appears that he was able to hold his own in this wordy warfare."

"Galen was himself a large-sized bundle of conceit, prone both to dilate upon his own wisdom and skill and very fond of reciting his own remarkable

cures and emphasizing the impossibility of less wise individuals accomplishing similar results."

No other physician has ever occupied the commanding position of Claudius Galen. For fifteen centuries he dominated medical thought as powerfully as did Aristotle in the schools of the day. Not until the Renaissance did daring spirits begin to question the infallibility of this medical Pope.

The more we know of Galen, however, the less surprised are we at his hold over the minds of men. Only those who are ignorant of Galen's immense knowledge, his practical common sense, and the frequent marvellous anticipations of what we think most modern, affect to despise him.

No writer of either ancient or modern times can compare with Claudius Galenus probably in the abundance of his output, but certainly in the influence he exercised over the generations that followed him. For fifteen hundred years the doctrines he formulated, the compound medicines he either introduced or endorsed, and the treatments he recommended commanded almost universal submission among medical practitioners.

Ancient scientific medicine reached the summit of its development when Galen's last great volume was printed. His system of medicine comprised all that was known in his time.

"Galen was the last of the Greeks and when he spoke no more, the voice of the ancient world was hushed. Galen was the final star that shone in the twilight of antiquity, and when his effulgence was extinguished, there settled over Europe a darkness that was not lifted for many centuries."

HEROPHILUS AND ERASISTRATUS

There were many great physicians during the golden age of medicine in Greece. Two of these were connected with the University of Alexandria, established in the fourth century B. C., and drew its sustenance not from Egypt but from Greece—Herophilus (about 300 B. C.), who is called the Father of Anatomy, and Erasistratus (about 360 B. C.), who is called the Father of Physiology. These two physicians are the first who publicly dissected the human body—and it has been whispered down the ages that condemned criminals were furnished to these investigators who were thus enabled to contrast dissection with vivisection. The first who made this statement was Celsus: "They procured criminals out of prison by royal permission, and dissecting them alive, contemplated, while they were yet breathing, the parts which nature had before concealed."

Because Herophilus was the first who regularly dissected the body of man and studied it systematically, he is known as the Father of Anatomy.

Examples of the sayings of Herophilus include: "He is the best physician who knows how to distinguish the possible from the impossible." "Medicines are nothing in themselves, if not properly used, but the very hands of the gods, if employed with reason and prudence." "To lose one's health renders science null, art inglorious, strength effortless, wealth useless and eloquence powerless." They deserve a place beside Sophocles' "Sleep is the physician of pain," and "Death is the supreme healer of maladies."

There are many interesting anecdotes concerning Herophilus. One of the best of these relates to the keenness of his medical insight. While he was examining the patient, Stratonice, a young woman, one of the elderly king's wives, entered the room. From the quickening of the sick man's pulse and from the flush which spread over his cheeks, the doctor recognized that the illness was mental rather than bodily—that a passion for his inaccessible step-mother was at the root of the trouble.

According to another ancient tradition, Erasistratus presented the temple of the Pythian Apollo at Delphi with a pair of dental forceps made out of lead—as a hint that doctors would do well to extract only such teeth as were loose in their sockets.

AULUS CORNELIUS CELSUS

Aulus Cornelius Celsus, the most distinguished Roman writer on medicine, lived in the age of Tiberius between 14 A. D. and 37 A. D. He has been called the Father of Plastic Surgery, and was admiringly known as the Roman Hippocrates.

Celsus is notable for the description of inflammation, familiar to every medical student: redness, swelling, heat and pain (*rubor et tumor, cum calore et dolore*).

The only remaining works of Celsus, *De Re Medicina*, contained, among the other data, authentic principles of plastic surgery. Published 1300 years after his death, this volume was one of the first medical books to be printed (1478), passed through more editions than any other scientific treatise of that era.

Among the many accomplishments of Celsus was his description of forty skin diseases.

One of Celsus' prescriptions for preventing the decay of the teeth was called "sory." It consisted of poppy seed, pepper, and copper sulphate, made into a paste with galbanum. He also employed enemas of sea-water, and poultices of flaxseed or of foenugreek.

Celsus describes the ideal surgeon as follows:

"A surgeon ought to be young, or at any rate, not very old; his hand should be firm and steady, and never shake; he should be able to use his left hand with as much dexterity as his right; his eye-sight should be acute and clear; his mind intrepid, and so far subject to pity as to make him desirous of the recovery of his patient, but not so far as to suffer himself to be moved by his cries; he should neither hurry the operation more than the case requires, nor cut less than is necessary, but do everything just as if the other's screams made no impression upon him."

DIOCLES

In the second half of the fourth century B. C. there arose a great doctor in Athens. Diocles by name, he was born in Carystus, on the island of Euboea. He wrote a great work on hygiene.

He was a dissector of animals and occasionally of human material, and wrote the first Greek herbal and the first book entitled *ON ANATOMY*, and was acclaimed the greatest physician after Hippocrates. He is to be grouped there-

fore with Alcmaeon of Croton, the discoverer of the optic nerves, and with Diogenes of Apollonia, the investigator of the blood vessels, as among the forerunners of Herophilus.

EMPEDOCLES

Empedocles, in the fifth century, B. C., was the first comparative anatomist. Empedocles must have had a crude idea of the circulation of the blood, for he says: "The heart lies in seas of blood which dart in opposite directions."

ANCIENT MEDICAL SCHOOLS

The professors in the luxurious medical colleges in Nineveh, Babylon, Thebes, Memphis, Sais, Heliopolis, Silsilis, and other cities, gave daily lectures on therapeutics and pharmacology to students from all parts of the civilized world. Their extensive knowledge of drugs was handed down to them from a remote antiquity.

The first modern university was the University of Alexandria, established in the fourth century B. C. Among the learned men who answered the summons to Alexandria were two physicians, Herophilus and Erasistratus, whose writings were of considerable note. Anatomy and physiology, the first of the basic and experimental sciences born of medicine, were cradled in Alexandria—but drew their sustenance not from Egypt, but from Greece. During the centuries that this medical school flourished, it was unrivaled. Several of these pupils acquired practice and fame, though none of the Alexandrians approached in importance the founders of the school—Herophilus and Erasistratus.

MEDICINE IN ROME

CHAPTER IV

To begin with, Roman medicine had been primitive medicine. As everywhere else, so there, it had been a mixture of religious and magical ideas with empirical knowledge. One who was stricken with fever, prayed to the goddess of fever. A pregnant woman offered up sacrifices to Lucina or Carmenta. Even during the era of the republic, the art of medicine remained extremely primitive. There were domestic remedies for pains and coughs and diarrhea. Cabbage was regarded as an extremely valuable drug. A certain amount of knowledge had been acquired concerning the treatment of wounds, and splints were applied to a broken bone. But in addition to such means, or when they proved ineffective, recourse was had to spells and charms. Common, too, was the practice of wearing amulets to protect against the evil eye and other sinister powers. One who owned numerous slaves was certain to have among them a person regarded as skilled in medical matters. Such a slave was extremely valuable in the household, and commanded a high price.

Cato, the dominant Roman for three generations, stood in the path of Greek learning. Cabbage was his panacea. He wrote: "Cabbage is good for everything." And this further: "keep the urine of one who is wont to eat cabbage. Warm it. Immerse the patient in it. You will soon cure him by this treatment. It has been tried. Also if you wash small children with this urine, they will never become weakly. And if there is any bruise it will break it up and heal it if you apply mashed cabbage. And if any ulcer and cancer arise in the breasts apply mashed cabbage, it will heal it."

"Averse to sexual passion, he supervised the coition of his dependents. Preaching purity, he was detected in his own home in the act of corrupting a slave-girl. The apostle of continence, in his old age he took a young bride. Such was the man without a vice, who made virtue loathsome."

While the Greeks were developing their rational system of medicine, the Romans were without any systematized medicine. They had, instead, systematized superstitions. They looked for aid from their deities, of which there was one for every disease and indeed for every stage of every disease. Their medical practice is summed up in the statement that "even the itch was not without its goddess."

The Romans at first had no laws to punish malpractice, poisoning, and the manipulation of wills by hired physicians.

Pliny, the lawyer, who lived in the first century after Christ, says of physicians: "It is at the expense of our perils that they learn, and they experiment by putting us to death, a physician being the only person that can kill another with sovereign impunity. Nay, even more than this, all the blame is thrown upon the sick man only; he is accused of disobedience forthwith, and it is the person who is dead and gone that is put upon trial."

When Corinth was destroyed in 146 B. C., Greece lost her dominating influence. Weakened by barbarian immigration which destroyed the vigor of the race, the better class of Greeks, and particularly the merchants and professional men, including the doctors, were among the first to migrate to and settle in Rome, where they labored and taught for several centuries.

The Greek doctors found a fertile field for their services in Rome. Ever-increasing luxurious living had a sequence of weaknesses and diseases, which were unknown before and which the herbalists, quacks, and family medicines could not cope with.

ARCHAGATHUS

The first Greek physician who settled in Rome was appropriately named Archagathus, which means a good beginning.

ASCLEPIADES

On the whole the newcomers were regarded with distrust, but finally one of them succeeded in establishing Greek medicine upon a firm footing in Rome. This was Asclepiades, a native of Bithynia.

He knew how to blow his own trumpet. He promised "*curare tuto, celeriter, et jucunde*"—to cure safely, swiftly, and pleasantly. (This phrase originated with him). A man, he said, would be a poor physician who had not two or three remedies ready for use in every case of illness; well-tried remedies. He himself had such remedies. Nor were these remedies the violent purgatives and vomitories of his colleagues. He cured by prescribing fasts, abstinence, massage, active and passive movements.

If a doctor fell sick, laymen were wont to make fun of him, saying sarcastically "*Merice cura te ipsum*" (Physician, heal thyself). It is said that Asclepiades proclaimed that he would no longer call himself a physician if he ever fell sick. When well advanced in years, he did not die of illness but of an accident, through falling down a flight of stairs.

In medicine the Romans did little or nothing. All their medicine they borrowed from the Greeks, adding nothing of their own, except their great contribution in the field of public sanitation. The practical Romans were better plumbers than the Greeks—their aqueducts are still working; otherwise, the legacy of Rome is largely evil.

In Rome, Greek medicine reached its second climax before its ultimate fall, which was ascribed to the prohibition of human dissection.

"So bloodthirsty were the Romans of this period, that neither the populace nor the fashionables could enjoy a holiday unless contending ranks of gladiators were butchered for their sport, but they recoiled with horror at the notion of permitting a scientist to examine the murdered corpse."

"Rome, which would not attend a circus unless human blood was spilled, blunted the scalpel. Those ages which destroyed life for amusement, or took it at the least provocation, were the most stringent in protecting the cadaver."

When in 330 A. D., the capital of the Roman Empire was removed from Rome to Constantinople, the leading professional men went with Constantine to his new home.

GREEK PHYSICIANS IN ROME

There were many famous Greek physicians and surgeons who settled in Rome. A few of them will be mentioned.

CLAUDIUS GALEN entered Rome in the year 162 A. D. and practiced there for four years.

ANTYLLUS was the creator of arterial surgery, and was the first to distinguish aneurysm caused by pathological dilatation and aneurysm forming after trauma of the artery.

ARCHIGENES was one of the great surgeons of his era, operating in cancer of the breast and womb, and amputating limbs, with employment of the ligature, in a manner that we consider modern. He wrote the best contemporary account of leprosy, distinguished between primary and secondary symptoms in disease "and found time—in the intervals of using the vaginal speculum and prescribing hair-dyes for the fashionable ladies—to become the author of the most elaborate of the ancient treatises on the pulse."

ARETAEUS described asthma, tetanus, epilepsy, diphtheria, hysteria, satyriasis, warned against excess of bloodletting, seems to have understood the direction of the blood-flow in the veins, and was the author of the first systematic account of diabetes.

Aretaeus made the following remarks on the treatment of epilepsy: "It is told, that the brain of a vulture, and the heart of a raw cormorant, and the domestic weasel, when eaten, remove the disease; but I have never tried these things. However, I have seen persons holding a cup below the wound of a man recently slaughtered, and drinking a draught of the blood! O the present, the mighty necessity, which compels one to remedy the evil by such a wicked abomination! And whether even they recovered by this means no one could tell me for certain. There is another story of the liver of a man having been eaten. However, I leave these things to be described by those who would bear to try such means."

Aretaeus' advice for procuring sleep was as follows: "Gentle rubbing of the feet with oil, patting of the head, and particularly stroking of the temples and ears is an effectual means; for by the stroking of their ears and temples wild beasts are overcome, so as to cease from their anger and fury. But whatever is familiar to any one is to him provocative of sleep. Thus, to the sailor, repose in a boat, and being carried about on the sea, the sound of the beach, the murmur of the waves, the boom of the winds, and the scent of the sea and the ship. But to the musician the accustomed notes of his flute in stillness; or playing on the harp or lyre, or the exercise of musical children with song. To a teacher, intercourse with the tattle of children. Different persons are soothed to sleep by different means."

Aretaeus continued as follows: "For it is the semen, when possessed of vitality, which makes us to be men, hot, well braced in limbs, hairy, well voiced, spirited, strong to think and to act, as the characteristics of men prove. For when the semen is not possessed of its vitality, persons become shriveled, have a sharp tone of voice, lose their hair and their beard, and become effeminate, as the characteristics of eunuchs prove."

"If you give a medicine at the height of the dyspnea, or when death is at hand, you may be blamed for the patient's death by the vulgar."

"When he can render no further aid, the physician alone can still mourn as a man with his incurable patient: this is the physician's sad lot."

ASCLEPIADES has been called the Father of Fashionable Physicians.

He was born in Bithynia about 96 B. C. He located in Rome, where he became famous as a practitioner. He began his career by teaching rhetoric.

He found he could not make much money as a rhetorician, but it helped him enormously in medicine.

One day a funeral procession was winding its way through the streets of Rome. Suddenly a loud voice startled all: "I am Asclepiades, and I say take this funeral feast from the pyre to the table." Asclepiades brought the body to his house, applied restoratives which reestablished respiration, and the supposed corpse participated in his own funeral festivities.

Did Hippocrates say, "Nature is the healer of disease?" Then Asclepiades said, "Not only is nature useless, it may even be harmful. A natural healing power, curing diseases by design, is a delusion. The physician must actively interfere with nature. It is the physician's duty to cure safely, quickly, pleasantly"—and here we have the origin of the classic phrase: *tuto, cito et jucunde*.

Pliny criticized Asclepiades in the following language: "There is, however, one thing, and one thing only, at which we have any ground for indignation—the fact, that a single individual, and he belonging to the most frivolous nation in the world, a man born in utter indigence, should all on a sudden, and that, too, for the sole purpose of increasing his income, give a new code of medical laws to mankind."

Though Asclepiades was a charlatan he had much to his credit. He was the first who definitely divided disease into acute and chronic, he described malaria, catalepsy, frenzy and lethargy, and treated the insane with gentleness, sunlight, music and song.

This ex-rhetorician was a foreigner, but he knew his Romans. His treatment consisted in massage, wine, exercise, such as walking, riding or dancing, bathing, etc. He often permitted luxurious meals, in some cases he prescribed plenty of sleep, and in others sexual intercourse.

HELIODORUS' writings have been mostly lost, but the few fragments saved reveal him as a great surgeon. He says: "Amputation above the elbow or knee is very dangerous owing to the size of the vessels divided. Some operators in their foolish haste cut through all the soft parts at one stroke, but it seems to me better to first divide the flesh on the side away from the vessels, and then to saw the bone, so as to be ready at once to check the bleeding when the large vessels are cut. And before operating, it is my habit to tie a ligature as tightly as possible above the point of amputation." He wrote on operative treatment of hernia, stricture, resections, flap and circular amputations, bandaging, probing injuries to the skull and torsion of blood-vessels.

Juvenal has branded Heliodorus with infamy because he castrated robust young slaves so their lustful mistresses may use them with impunity: "Matron and maid, the sex has turned all whore; to escape abortion they love the eunuchs, but only such as have been gelded at manhood's age; all that the navel-string could give is present except the beard—and that's the barber's loss, not theirs."

THEMISON OF LAODICEA was the most conspicuous disciple of Asclepiades. Themison considered his doctrines a middle way or method between the dogmatists and empiricists, and was responsible for the formation of another medical sect—the Methodic School. He was once bitten by a mad dog, and therefore could not write on rabies without developing the symptoms.

Juvenal, the magnificent hater, who coined the expression of matrimonial halter, and greeted a rake's announcement that he had found a girl of old-fashioned virtue with the exclamation, "O physicians! open the middle vein, he is mad!" wrote of Themison:

"Besides all this, the little blood in the old man's chilly frame is never warm except with fever. All kinds of diseases dance around him in a troop. If you were to ask their names, I could sooner tell you how many lovers Hippias had; how many patients Themison has killed off in a single autumn; how many partners Basilus has cheated; how many wards Hirrus has corrupted; how many embraces tall Maura has submitted to in a single day."

DIOSCORIDES, an army surgeon in the service of Nero, in which capacity he traveled extensively, everywhere on the lookout for medicines, is the greatest of medical botanists. In the sense that Hippocrates is the Father of Medicine, and Theophrastus, the Father of Botany, Dioscorides is the Father of *Materia Medica*.

Opium was known long before his time, but Dioscorides was the first who distinctly praised it. He pointed out that it allays pain, induces sleep, is useful in chronic coughs, and in overdoses occasions a deep and terrible lethargy.

SORANUS of Ephesus in Asia Minor—nearly all the leading Greek physicians of the Roman empire came from Asia Minor—stands out as the first specialist in diseases of women and children. Like most of the famous physicians of the time, he studied in Alexandria, and settled in Rome.

ARABIAN MEDICINE IN THE MIDDLE AGES

CHAPTER V

For considerably over a thousand years we find that Arabian medicine was based upon the Greek systems, and Persia brought it to maturity. The influence of the doctors of Islam upon modern medicine was profound. They snatched the torch of Hellenistic culture before it was snuffed out at the beginning of the Dark Ages, and preserved the remains until scholarship was revived in the fifteenth and sixteenth centuries.

The Arabs not only preserved the medical books and practices of antiquity, but they also raised the status of medicine in Europe from a menial condition to a learned profession, by establishing schools and insisting upon a system of rigid qualifying examination for doctors. Chemistry, as applied to medicine, was also their discovery.

In one respect the Persians were wiser than the Greeks, for they informed Heroditus: "We think that it is wrong to carry women off: but to be zealous to avenge the rape is foolish: wise men take no account of such things: for plainly the women would never have been carried away, had not they themselves wished it. We of Asia regarded the rape of our women not at all; but the Greeks, all for the sake of a Lacadaemonian woman, mustered a great host, came to Asia, and destroyed the power of Priam. Ever since then we have regarded the Greeks as our enemies."

Much of the early Arabian medical practice was based upon amulets. The Arabic amulets of earlier times consisted of a phrase from the Koran, written by the priest on papyrus (and later on paper). This was then put up in a leather or metal case and worn constantly as near the afflicted part as it was possible to keep it. It was necessary that the amulet must have been written by the priest on a Friday, shortly before sunset, and with ink containing certain drugs, as myrrh and saffron.

The Arabians contributed many new drugs and encouraged the use of some older ones which had almost been forgotten. We are indebted to them for the use of senna, camphor, rhubarb, musk, myrrh, cassia, tamarind, nutmeg, cloves, cubeb, aconite, ambergris, cannabis, and sandalwood. They were the originators of syrups, juleps, alcohol, and aromatic waters.

Some of the Arabian authorities speak of a form of anesthesia by inhalation. This was probably derived from the Chinese, for Hua To, the Hippocrates of China, is said to have taught this practice and used for the purpose a combination of aconite, Datura, and henbane. It was later revived in the thirteenth century, when it was called the "soporific sponge."

RHAZES (865-925)

The most distinguished of the Arabian physicians, who was called the Galen of his time, was the man whose rather lengthy Arabian name, beginning with Abu Bekr Mohammed, finished with el-Razi, and who has hence been usually referred to in the history of medicine as Rhazes. He was born at Raj, in Persia. He drew many pupils to Bagdad to benefit by his teaching.

Some of his aphorisms are said to have been:

"Truth in medicine is a goal which cannot be absolutely reached, and the art of healing, as it is described in books, is far beneath the practical experience of a skillful, thoughtful physician."

"At the beginning of a disease choose such remedies as will not lessen the patient's strength."

"Physicians ought to console their patients even if the signs of impending death seem to be present. For the bodies of men are dependent on their spirits."

"In treating a patient, let your first thought be to strengthen his natural vitality. If you strengthen that, you remove ever so many ills without more ado. If you weaken it, however, by the remedies that you use, you always work harm."

"The patient who consults a great many physicians is likely to have a very confused state of mind."

It was proposed to build a great hospital in Bagdad, and the Caliph consulted Rhazes about it. Rhazes selected the site by a simple but effective experiment. He had pieces of raw meat hung up in different parts of the city. The hospital was built at the point where the raw meat had decomposed least rapidly.

There is scarcely any feature of modern medicine and surgery that Rhazes does not touch, and oftener than not his touch is sure and rational. He was perhaps one of the first men to use sutures of animal gut for the repair of abdominal wounds.

Among the methods of treatment for which Rhazes is responsible may be mentioned that of phthisis, with milk and sugar; of high fever, with cold water; of weakness of the stomach and of the digestive organs, with cold water and buttermilk; and he advises sufferers from melancholia to play chess. He states that fever is not itself a disease, but an effort of nature to cast out a disease. He was particularly careful in the use of purgatives, which he said were apt to occasion irritation of the intestinal canal, and in dysentery he relied usually on fruits, rice, and farinaceous food, though in severe cases he ordered quicklime, arsenic, and opium.

Mercury in the form of ointment and corrosive sublimate were applied by him externally, the latter for itch; yellow and red arsenic and sulphates of iron and copper were also among his external remedies. Borax (which he called tenker), saltpetre, red coral, various precious stones, and oil of ants, are included among the internal remedies which he advises.

Rhazes would not have been ill-equipped for practice a thousand years before his time in the Isle of Cos or practice a thousand years later in a modern hospital.

ALI ABBAS

Ali Abbas, a distinguished Arabian physician who died near the end of the tenth century, was the successor in prestige to Rhazes.

He wrote the ROYAL BOOK OF MEDICINE. This became the leading textbook of medicine for the Arabs until replaced by the CANON OF AVICENNA some two centuries later.

Abbas realized that book-learning did not suffice for a physician. "It is incumbent," he wrote, "that the student of this Art should constantly attend the hospitals and sick-houses; pay unremitting attention to the conditions and circumstances of their inmates, in company with the most acute professors of Medicine; and enquire frequently as to the state of the patients and the symptoms apparent in them, bearing in mind what he has read about these variations, and what they indicate of good or evil."

Ali Abbas perceived that both sexes are prone to depression at the approach of puberty, and he classified love under melancholia, and recommended the following for lovesick youths: "They should take baths," said Ali Abbas, "moderate horse exercise, and anoint themselves with oil of violets. They should look upon gardens, fields, meadows and flowers, listen to sweet and low sounds as of the lute or lyre, and their minds should be occupied by stories, or pleasant and interesting news. But they must also have some work or business so as to keep them from idleness, and from thoughts of the loved ones; and it is good to excite them to quarrels and arguments, that their minds may be yet further distracted. Let them also cultivate the acquaintance of other young women."

ALBUCASIS (or Abulcasis)

Albucasis, like many contributors to medical literature from among the Arabs, was born in Spain, but he wrote in Arabic. The exact year of his birth is not known, but he flourished in the second half of the tenth century. He is said to have lived to the age of 101. His work represents the only independent surgical book produced during the whole of the Arabian period. He is said to be the conservator of dentistry in this period.

The Arabs have been described as blood-shy and knife-shy, but it was Albucasis who made the actual cautery their national instrument. Albucasis and Avicenna established the cautery as being a cure for practically all the ills with which Allah had seen fit to afflict mankind.

AVICENNA (About 980-1037)

Ibn Sina, whose Arabic name was transformed into Avicenna, was born in Persia, at the height of Arabian influence, and is sometimes spoken of as the chief representative of Arabian medicine, of as much importance for it as Galen for later Greek medicine. His principal book is the so-called CANON. It replaced the compendium CONTINENS of Rhazes, and, in the East, continued until the end of the fifteenth century to be looked upon as the most complete and best system of medicine. The CANON is both the epitome and the summation of Graeco-Arabian medicine. What Galen did for the Romans, Avicenna accomplished for the Moslems. His book, the ANTIDOTARIUM, is the foundation of our knowledge of the drug-giving of his time.

For over three centuries after the foundation of medical schools in Europe, Avicenna was still in the hands of all those who had an enthusiasm for medical science.

He attended the sick without fees, and says he was rewarded by discovering new methods of treatment.

Avicenna has been sleeping since the year 1037, but he still treats all the invalids of Persia. His activity was extraordinary, for he composed a treatise on many other subjects. At eighteen he cured a king of a serious illness, and the fee enchanted him: he was permitted to use the royal archives with its manuscripts that had no duplicates. This irreplaceable library disappeared in fire, and before its ashes had cooled, the rumor was spread that Avicenna burned it to hide the sources of his knowledge.

His amazing career began in his childhood, for at the age of ten he memorized the Koran; neither arithmetic nor Arabic poetry presented any difficulties. He found medicine easy: "Medicine is no hard and thorny science, like mathematics and metaphysics, so I soon made great progress; I became an excellent doctor, and began to treat patients, using approved remedies. . . . At twelve years of age I disputed in law and logic. . . . When I found a difficulty, I referred to my notes and prayed to the Creator. At night, when weak or sleepy, I strengthened myself with a glass of wine."

"The night was always young to Avicenna, and when manuscripts were put aside, the wine-jug was seldom empty, and he relaxed amid minstrels and dancing-girls. His sensualism was as famous as his scholarship, and all Islam asked: Which does Ibn Sina love the more—learning, or wine and women?"

AVENZOAR

Avenzoar, transformed from his family Arabic name, Ibn-Zohr, is counted among the greatest of the Spanish-Arabian physicians. He was probably born in Penafior, not far from Seville. He died in Seville in 1162 at the age, it is said, of ninety-two years.

Avenzoar wrote the first account of the Bezoar Stone, a superstition which prevailed for centuries. The name, bezoar, is derived from the Persian words, Pad-Zahr, meaning "expel poison." The pebbles were first popularized by the Arabs, who had many superstitions about stones. They came into use in Europe about the twelfth century and because of the high price they commanded were usually a remedy only of the nobility. While the original use of the bezoar was as an antidote to poisons, it came to be the valued remedy for all kinds of fevers, was applied externally in many skin diseases, and had the reputation of being able to cure even leprosy.

These stones were concretions found in the bodies of certain animals, notably as gallstones in goats, and were supposed to prevent melancholia and all kinds of poisoning. It was a very useful medicament in those bygone days when the art of poisoning was highly developed. In cases of suspected poisoning the bezoar was swallowed and recovery was assured. If the bezoar failed, the explanation was simple—the patient died of something else.

Avenzoar's folly is wiped out by his wisdom, for he has many accomplishments to his credit. His belief in the Bezoar Stone is proof that delusion and discernment may dwell in the same brain. There were many others who were deluded, for they were included in the London Pharmacopoeias from 1618 to 1746. Three bezoar stones were sent by the Shah of Persia as a royal gift for his brother the Emperor Napoleon, only a hundred and thirty years ago.

Avenzoar is interesting as probably being the first to suggest nutrition *per rectum*.

AVERROES

Among the distinguished contributors to medicine at this time, though more a philosopher than a physician, is the famous Averroes. Like Avenzoar, of whom he was the intimate personal friend, he was born in the south of Spain.

Averroes was an industrious student, and it is said that the night of his father's death and the night of his wedding-day were the only nights which he did not devote to intellectual labor.

He wrote much on the healing art, but his observation that smallpox does not attack the same person twice constitutes his sole original contribution to medicine.

Averroes fell under the suspicion of free thinking and was brought to trial with a number of personal friends, who occupied high positions in the Moorish government. He escaped with his life, but only after great risks, and he was banished to a suburb of Cordova, in which only Jews were allowed to live. By personal influence he succeeded in securing the pardon of himself and friends. He died, not long after, in 1198.

Taking the general average, medicine was not much improved by its sojourn among the Arabians. Anatomy, physiology and surgery retrograded. Chemistry was considerably improved, as was also materia medica. Their observations were faulty and they lacked originality. The prohibition in the Koran was a fatal handicap.

"The alleged differences between the three great Semitic religions stained continents with blood and strewed the earth with corpses, but all shrank with equal horror from the anatomist's knife. All united in the belief that whoever touches a cadaver is guilty of sin, and Medicine remained without a true basis for centuries. Hence Arabian medicine could not endure, and under accumulating knowledge it collapsed completely."

✓ ARABIAN HOSPITALS

It is interesting to find that 5,000 years ago a hospital should exist associated with, and under the patronage of, the Pharaoh, and having its own staff of physicians.

Moslem hospitals constitute one of the brightest phases of Arabian medicine. Islam founded hospitals throughout its dominions, and infirmaries for the blind and for lepers were established as early as 707. Every mosque had its hospital. There were asylums for the insane and Arabian lunatics were treated much better than those in Europe. There were sixty hospitals in Bagdad, "All well provided from the king's stores with spices and other necessaries, and every patient who claims assistance is fed at the king's expense until his cure is completed."

Sivarn ibn Thabit at Bagdad was a famous hospital administrator. The Buddhist king, Asoka, was the first great builder of hospitals for man and beast. Ephraim built the first large hospital in Edessa; and upon the ruins of pagan temples, Rabbula erected an infirmary exclusively for women. Duttha Gamani, feeling his earthly journey ending (161 B. C.), asked the records of his reign be read to him, and among the last words the dying king

heard were these: "I have daily maintained at eighteen different places, hospitals provided with suitable diet, and medicines prepared by physicians for the infirm."

Khalil Daheri wrote that even the healthy feigned illness to gain admittance: "While making the pilgrimage to Mecca, I stayed at Damascus, and had with me a certain Russian, a man of wit and intelligence, who followed the rites of the four orthodox sects, performing them all at the same time. When he went over the hospital and saw the patients' diet, and all their comforts and advantages, which are without number, he pretended to be ill and stayed three days there. The physician having felt his pulse recognized his case and prescribed any diet he liked, so he was fed upon young chickens, cakes, and sherbet, and all manner of fruits. But after two days the doctor wrote a prescription implying that a guest should not stay beyond the third day. They say the fire has never been put out at this hospital since it was built."

The ancient wisdom and science of the Greek and Latin authors, which was so well preserved by the Arabs, was transferred, when their passion for study and research began to fail, to European nations.

EUROPEAN MEDICINE IN THE MIDDLE AGES

CHAPTER VI

The Middle or so-called Dark Ages cover, roughly speaking, the period beginning when the barbarians captured Rome in 476 and scattered the learned men throughout the west, to the discovery of the New World in 1492, or as some reckon the period, to the time that Gutenberg invented the art of printing by moveable letters in the fifteenth century. Learning descended to its lowest depths in the ninth century, followed by a revival of learning in the eleventh century, the great intellectual awakening in the thirteenth century, which resulted in the Renaissance or New Birth in the fifteenth and sixteenth centuries.

All that Hippocrates and his loyal disciples had so patiently and painfully dug out of impassive nature, all that Galen had added to this store of information, was shrouded from view for over a thousand years. The thousand years between Galen and the Renaissance have always been known as the Dark Ages. One must carefully note however that the light of Greek medicine only faded; it was not snuffed out.

With the passing of Galen at the end of the second century, the thread of rational medicine snaps. Wherever we turn, the era of magic is upon us. Greek medicine, which in its classic days had been free from superstition, has ceased to function. Experiments are not performed, but miracles are expected.

Sextus Placitus treats fever by cutting a splinter from a door through which a eunuch has passed, and Marcellus Empiricus removes an abscess of the right eye by touching it with three fingers of the left hand, expectorating, and repeating thrice: "The mule brings into the world no young, nor does the stone produce wool; so may this disease come to no head, or if it comes to a head, may it wither away."

Diseases were generally regarded as a chastisement from God or a visitation of the devil. Severe acute diseases were generally held to be the result of poison; pestilences as the effect of poisoning of the springs. The monks frequently held the principle of *similia similibus*, and for example treated the poisoning occasioned by swallowing a toad, by directing the eating of another toad.

At all times people have looked to faith for the cure of illness. As in the days when Imhotep and Aesculapius were worshipped, so now.

During the Middle Ages faith healing was raised to a greater ascendancy than at any period other than the most primitive. It was the "age of faith." This would have been a golden age for Christian Scientists, those people who are mostly educated but sentimental, though the application of faith would not have been broad, as Christian Science makes no appeal to people who are poor. The best feature of Christian Science is the optimism it teaches to its followers; it teaches them not to brood over the ills of life.

Faith healing that is practiced today among civilized peoples differs only in form from the faith healing of the most primitive peoples. The howling medicine-man of former times and the quiet Christian Science healer of today use the same essential principles in their treatments. These essentials are to at-

tract the patient's attention, to gain his confidence, and to inspire him with faith in his recovery even to the extent of denying the existence of his disease.

THE UNIVERSAL TENDENCY

It would merely try the patience of the reader to enumerate even a tithe of the absurd things which have been and are being used by people, civilized and savage, as charms, talismans, and amulets.

Catherine de Medici wore a piece of an infant's skin as a charm, and Lord Byron presented an amulet of this nature to Prince Metternich. Pascal died with some undecipherable inscription sewn into his clothes. Charles V always wore a sachet of dried silkworms to protect him from vertigo. The Emperor Augustus wore a piece of the skin of a sea calf to keep the lightning from injuring him, and the Emperor Tiberius wore laurel round his neck for the same reason when a thunderstorm seemed to be approaching.

As late as the seventeenth century King Charles II of Spain had his confessor and two friars sit beside his bed while he slept to keep away the devils. Until recent times it was believed that night air caused disease and bedroom windows were closed tightly at night. This belief in the harmfulness of night air was a remnant of the ancient belief in wandering devils as the cause of disease.

It was during the Middle Ages that Petrarch uttered his criticisms and epigram about doctors: "Now the young man appears, puts on an air of importance, and murmurs unintelligibly while the people stare at him with astonishment, and his friends congratulate and applaud him. The bells are rung, trumpets sounded, rings and kisses exchanged, and the round cap of the Magister is placed on his head. Whereupon he, who had mounted the ceremonial chair a blockhead, descends from it a wise man. This is a metamorphosis of which Ovid knew nothing."

He did not admire a well-dressed doctor: "Add to this the indecent finery of usurped garments, of purple mixed with other colors, sparkling rings, gilded spurs, and tell me where is there an eye, healthy as it may be, which can defend itself against such dazzling magnificence?"

The Hippocratic aphorism (Life is short, and the Art long: *vita brevis, longa ars*) which the whole Latin world quoted with approval, received this additional commentary from Petrarch: "Life in itself is short enough, but the physicians with their art, know to their amusement, how to make it still shorter."

The Middle Ages which were successful in quarantining leprosy, failed in their efforts against prostitution. "Theodora, the crowned whore, thought of a way of reforming other prostitutes; she transferred five hundred from the brothels of Constantinople to a peaceful retreat on the Asiatic shore of the Bosphorus; it was a beautiful home, half prison, half convent, entirely safe from male invasion: many of the inmates threw themselves in the sea, and others died from unbearable boredom."

Sexual laxity was the rule, and amiability the fashion. It has been said if Hildebrand had emasculated his clergy instead of merely forbidding them to marry, he would have deprived the middle ages of their choicest scandals.

There were old Parliamentary suggestions to brothel-keepers: "No host

shall receive a female from ecclesiastical institutions, nor shall he receive a married woman," and "No host shall keep a maiden who has the dangerous burning disease." Iron drawers, known as chastity belts, which could not be removed except with the husband's key, were made for women. Prudent men, before departing on a journey, guarded the virtue of the wife by thus padlocking the genitalia. These girdles of chastity were sometimes manufactured from old armor, but at other times were exquisite samples of the goldsmith's art—velvet-covered hoops fitting snugly around the waist, from which projected a sheet of gold anatomically covering the parts to be protected, with ingenious openings allowing for the performance of the calls of nature, the entire apparatus kept in place by a lock responding only to a special key.

THE ROYAL TOUCH

In Great Britain, in 1042, the progress of medicine was clouded by the institution of the "royal touch" under Edward the Confessor, but it was not until the time of Henry VII, in the fifteenth century, that the practice was made into an elaborate church ceremony.

An entry in the diary of Charles II, dated May 29, 1660: "His Majesty began to touch for the Evil according to custom, thus: His Majesty sitting under his state in the banqueting house, the chirurgeons cause the sick to be brought, or led, up to the throne, where they kneel; the King strokes their faces or cheeks with both hands at once, at which instance a chaplain in his formalities says, 'He put his hands upon them, and he healed them'."

What the King was conducting was a tuberculosis clinic; the king's evil was scrofula, tuberculosis of the lymph glands, particularly those of the neck. The disease was once very prevalent, and the people affected were badly deformed by the scars from the chronically discharging abscesses.

Charles II was the busiest of all the royal touchers. One day in 1684 the crowd applying for treatment was so great that six or seven of the sick were trampled to death. It is noteworthy that more people are said to have died of scrofula in the time of Charles II than at any other period of English history.

William of Orange, who came to the throne in 1688, refused to continue the practice of the Royal Touch, and in consequence the people accused him of cruelty. Only on one single occasion was William importuned into laying his hands on a patient. "God give you better health," he said, "and more sense."

Queen Anne, however, who followed him to the throne, was a superstitious woman, and she at once revived the practice, the last of the English royalty to do so. The famous lexicographer, Dr. Samuel Johnson, was one of the last persons touched for scrofula by Queen Anne. On at least one occasion Queen Anne had to issue a royal proclamation postponing the ceremony, for, as a chronicler of the time says: "Her Majesty did not touch, yesterday, for the Evil, as designed, having gout in her hands."

In 1684, Thomas Rosewell was tried for high treason for speaking disparagingly of the Touch.

In the tenth century the following was used for sea-sickness: "To prevent sea-sickness the traveller had to smear himself with a mixture of pennyroyal and wormwood in oil and vinegar. Peony laid over a lunatic would soon cause him to upheave himself whole; and vervain or verbenā if carried on the person would ensure a man from being barked at by dogs."

Philon, a physician of Tarsus, invented *Philonium*, a celebrated preparation which was used for centuries. It was composed of opium, saffron, pyrethrum, euphorbium, pepper, henbane, spikenard, honey, and other ingredients. One of its ingredients was "the red hair of a lad whose blood had been shed on the fields of Mercury," and the names of other ingredients are also disguised in mystic language.

Up to the eleventh century England was under the barbaric dominion of the Saxons. The practice of medicine during these times was confined almost exclusively to the use of herbs, incantations, magic and necromancy. After the Norman conquest was in full force however, the English authorities began to recognize the demands of rational medicine by sending their physicians abroad to be educated in the clerical schools that were active during the scholastic period.

THERIAC

Notable among the remedies of the Middle Ages in Europe was Theriac, a name which had been originated by Nicander of Colophon, a compound with a fantastically chequered history.

Among the papers of the vanquished King, Mithridates Eupator, Pompey discovered the formula for the famous confection or electuary which at that time was called *Confectio Mithridates*, and was later improved by Damocrates, physician to Nero, after whom it was subsequently called *Confectio Damocratis*. It is said that the formula, as discovered in the fallen monarch's effects, called only for "twenty leaves of rue, a pinch of salt, two nuts, and two dried figs." This was too ridiculously simple to inspire any confidence in its effect, so a more complicated formula was given out by Damocrates.

Most of the old masters in pharmacy fancied they could suggest some improvement, and the original formula was modified in scores of ways and became to consist of many ingredients. It was the addition of vipers to the confection of Mithridates that constituted the principal improvement effected by Andromachus.

The enumeration of the medicinal properties of the antidote left very little room for any other remedy. First it would counteract all poisons and bites of venomous animals. Besides, it would relieve all pains, weaknesses of the stomach, asthma, difficulty of breathing, phthisis, colic, jaundice, dropsy, weakness of sight, inflammation of the bladder and of the kidneys, and plague. Down to the seventeenth century these virtues were almost universally accepted, and many were the learned treatises written to explain its action; how one drug toned down the effect of others, and how the whole formed a sort of harmony in medicine.

Eventually theriac became known as treacle, and when theriac was discarded as a remedy the term treacle was applied to molasses. The sulphur and treacle administered to all young people a generation or two ago as a

spring tonic was derived from the old belief in theriac. Charles Dickens referred to the frequent use of treacle in the boys' schools of England.

DANCING MANIA

The dancing mania began and was propagated by the sight of the sufferers from the great Plague, Black Death. It was not a new affliction. There had been isolated outbreaks of this mob excitement previously, but never before had so many people been drawn into the mania. In 1374 a group of men and women who had come out of Germany wandered into the streets of Aix-la-Chapelle. The members of the band formed a circle and then began to dance. In 1418 this mental turmoil reached its highest point in the city of Strassburg.

Saint Vitus became the patron of these sufferers, who in their calmer moments appealed for his aid to keep them from the paroxysms of their mania. This term has survived from the days of the dancing mania. Although we no longer have the mania, the term is applied to a certain nervous disease in which there is twitching of the face and arms; otherwise it has no relation to the mental malady described.

CRUSADES

When Peter the Hermit and Walter the Penniless organized the first crusade, toward the end of the eleventh century, they started a movement that developed into the Renaissance nearly four centuries thereafter. It is said that the emotional appeals of Peter caused multitudes of peasants to follow the hoof-prints of his mule.

What the Crusaders learnt from the Saracens supplemented the knowledge gained from the flow of translations, which transmitted all the accepted ideas of many centuries before from East to West.

The crusades were conducted with almost unbelievable cruelty. They represented all types of people and as they advanced by slow marches, begging food and clothing as they went, they spread disease in every community they came in contact with, and prepared the way for countless epidemics.

If a crusader was a man of influence, his bones were boiled and transported home for burial. In 1300 Pope Boniface stopped it with the following: "Persons cutting up the bodies of the dead, barbarously boiling them, in order that the bones, being separated from the flesh, may be carried for burial into their own countries, are by the very act excommunicated."

Indirectly medicine ultimately profited greatly by the commerce which these wars opened up between the East and the West, and the diseases which were spread as the consequence of the intimate association of the unwholesome hordes from all the nations concerned, resulted in the establishment of thousands of hospitals all over Europe.

Constantine Africanus, a professor in the medical school of Salerno, as if with a magic key, opened the world of the East to the West.

THE MEDICAL SCHOOL OF SALERNO ✓

In the science of medicine the Arabians have been deservedly applauded. The School of Salerno, their legitimate offspring, revived in Italy and Europe

the precepts of the healing art. An Arab physician had persuaded some Benedictine monks to establish a hospital and medical school near Salerno, Italy. The only institutions of that character were in Spain, Morocco, and Algeria. In Christendom, they had been suppressed for nearly 1,500 years. The monks heeded the Arab's request, because they knew the need of a hospital and medical attention.

The School of Salerno was the principal link between the later Greek physicians and the teaching institutions which remain with us to this day. The origin of the school of Salerno is unknown, but it was certainly in existence in the ninth century.

It was the first institution in Europe to bear any resemblance to a university. Their works were many and various, and among them was the *REGIMEN SANITATIS SALERNI*. This was one of the most popular medical works ever written. The author was supposed to be one John of Milan, head of the faculty of the School of Salerno at the time it was written.

The school was organized in the ninth century, often spoken of as the darkest of the centuries, reached its highest point of influence at the end of the twelfth century, and was finally abolished by Napoleon on November 29, 1811, after having been in existence for nearly a thousand years.

The decline of the school was as rapid as her career had been brilliant and glorious. Perhaps the most serious blow at her supremacy was the foundation, by Frederick II in 1224, of the University of Naples, an institution upon which that prince bestowed unusual privileges, and in aid of which he and his successors authorized much special legislation, and gave numerous monetary gifts.

Roger Frugardi of Palermo was a surgeon of Salerno, and Trotula, a woman physician, was a teacher at Salerno.

The school of Salerno was located at Salerno, a flourishing seaport lying not far to the south of Naples. Norman Duke Robert took Salerno in 1076 and for a time its university was the leading educational center of Christendom. In 1095 the First Crusade began and Salerno acquired additional importance because it was the location of the base hospital for the militant Christians.

OTHER MEDICAL SCHOOLS

In the twelfth century the medical school of Montpellier began to come to the fore, and the universities of Oxford, Cambridge, and Bologna were founded. During the thirteenth century came the establishment of the universities of Paris and Naples, that of Messina, and above all that of Padua. The foundation of the universities of Prague, Vienna, Heidelberg, Cologne, and Erfurt occurred in the fourteenth century.

Not until 1140 was issued the first European law of medical licensure. It seems rather strange that the above act preceded the establishment of the first medical school by a century—sort of putting the cart before the horse. This law was issued by Grandfather Roger: "Whoever will henceforth practise medicine, let him present himself to our officials and judges to be examined by them; but if he presume of his own temerity, let him be imprisoned and all his goods sold by auction. The object of this is to prevent the subjects of our kingdom incurring peril through the ignorance of physicians."

However, it was not until 1515 that any ordinances were passed for the regulation of the guilds of barbers, bathers and surgeons.

Medical titles change as well as the remedies used and the method of treatment. The title of the medical practitioner is not the same in all countries, and the popular meaning of the words and titles has so changed that the original signification is, in some instances, almost lost. Thus, in English history we have record of the following appellations having been used: Physician, leech, mire or myre, barbers, barber-surgeon, chirurgon, surgeon, doctor. Neither surgeons nor physicians of the present day in Great Britain are called doctors, but are spoken of as surgeon or Mr. In the United States, however, they are almost invariably denominated doctor.

An insight into the practice of medicine in the thirteenth century can be obtained by examining the methods of Petrus Hispanus, a Portuguese physician who was described as "in all things, a scholar; and in medicine a specialist." He practiced both medicine and theology and was so successful that in the same year (1276) he was physician to Pope Gregory X and cardinal-bishop of Frascati. He used the following prescription for hysterical women: "I can say from experience that if a large cupping glass (a common jar will do) be applied to the lower part of the patient's abdomen, with free use of the red-hot iron, it will most thoroughly cure this disease. In hysterical fainting blow pepper and salt up the patient's nose. She will soon come round."

He knew that scabies could be cured in a day by sulphur, and many of his speculations are brilliant. However, we must not praise him too soon, for like the rest of his contemporaries, he believed in witchcraft and demons, advised epileptics to carry a parchment bearing the names of the three wise men of the East, and declared that "wearing the heart of a vulture makes one popular with all men and very wealthy, and that by vivisection the bird hoopoe and eating its palpitating heart one may learn the future and all secrets concealed in man's minds."

Even in an age when remedies were valued according to their nastiness, Peter managed to distinguish himself as the champion of the therapeutics of dung.

Gilbertus Anglicus' COMPENDIUM MEDICINE is the first complete treatise on general medicine by an Englishman. Valuable passages are clouded by others that are disgraceful. His method of treating sexual impotence follows: "Let a man, twenty years of age or more, before the third hour of the vigil of St. John the Baptist, pull up by the roots a specimen of comfrey (*consolida major*) and another of heal all (*consolida minor*), repeating thrice the Lord's prayer. Let him speak to none while going or returning, not even one word, but in deep silence let him extract the juice from the herbs, and with it write on parchment this charm: The Lord said increase x Utiboth x and multiply x thabechay x and replenish the earth x amath x. If a man wears around his neck a card inscribed with these identical words written in this juice, he will beget a male; conversely, if a woman, she will conceive a female."

Gilbertus has such faith in the potency of this charm that he informs the wearer what to do if it produces satyriasis. In other fields he is not more sensible: he mentions asses' hoofs attached to the patient's leg as treatment for

gout, the water in which a murderer has rinsed his hands as an aid in childbirth, and a grunting sow tied to the bed as the cure for lethargy.

Gilbertus indicates that he himself is not favorably disposed toward some of the remedies he describes, but he hesitates to omit what others have included; in places he intimates he would willingly discard the popular complicated formulae of his time for the simple expectant treatment of Hippocrates, but he does not wish his contemporaries to regard him as peculiar.

A distinguished Jewish physician who lived in the twelfth and thirteenth centuries was Moses Maimonides, "Eagle of the Doctors," a pupil of Averroes. He was born at Cordova, Spain, on the 30th of March, 1135 or 1139, the year is in doubt, and died in 1204. His family was expelled from Cordova in 1148, and his life was one of many vicissitudes. He achieved such renown in Egypt that his contemporaries said: "From Moses unto Moses there arose not one like Moses."

He published much medical literature, including works in 1168, 1180 and 1190. His rules of life and health have become part of our popular medical tradition.

He wrote treatises on asthma, hygiene, coitus, hemorrhoids, and on poisons and antidotes. Maimonides was willing to be guided by Galen until Galen came in conflict with Moses, then he threw Galen overboard.

In addition to the name of Gilbertus Anglicus, already noted, two others of this period, who lived in the fourteenth century, should be mentioned, Bernard de Gordon and John of Gaddesden. This special mention is made not because of any outstanding accomplishments by any one of these three individuals, but rather for the reason that in noting them, we receive our first formal introduction to English medicine.

Bernard Gordon, who taught at Montpellier, was probably a Frenchman of Scotch descent and never practiced in England. He entitled his work the Lilly of Medicine. It is a sidelight on the times that physicians, in entitling their books, competed with ballad-mongers; works dealing largely with the therapeutics of excrements bore the poetic names of Flowers of Medicine or Laurels of Practice.

Gordon names the eight diseases which at that time (1305) were considered contagious: acute fever, phthisis, scabies, epilepsy, erysipelas, anthrax, conjunctivitis, leprosy.

Gordon's book contains the first reference in medical literature to eye-glasses, which were first made from the stone beryllus, but he spoils it by adding that whoever uses his eye-salve—the best that God has revealed—will find spectacles unnecessary.

John of Gaddesden (1280-1361), was also one of the three Englishmen, all bearing the name of John, who, at varying periods in the fourteenth century made their individual contributions to surgery. The first of them, John of Gaddesden, was more of a physician than a surgeon. John of Arderne was more of a surgeon than a physician. John of Mirfield was neither physician nor surgeon, but rather a priestly bibliophile.

John of Gaddesden (1280-1361), who lived almost a century later than Gilbert Anglicus, was court physician and a fellow and professor at Merton College, Oxford. His main work, compiled in 1314 under the title of *Rosa An-*

GLICA is a hodgepodge of mysticism, superstition, and revolting therapeutics, such as hog's dung for hemorrhage.

John of Gaddesden is supposed to have been the original of Chaucer's DOCTOUR OF PHISIKE, published in the latter half of the fourteenth century:

"Well could he fortune the ascendant
Of his images for his patient
He knew the cause of every malady
Were it of cold, or hot, or moist, or dry,
And where engendered and of what humour.
He was a very perfect practisour."

John of Arderne, the second one of the Three Johns, was the first English surgeon worthy to be classed with the men who were recreating surgery in Europe. He was born in A. D. 1307. He was trained in the wars, was a bold surgeon and a shrewd diagnostician. He referred to himself as a surgeon among physicians, and looked down upon barbers who practiced surgery.

John of Arderne's most important contribution to surgery was the operation he devised for the cure of anal fistula, a condition that most of his predecessors regarded as incurable. His operation was practically identical with the one performed today. He was probably correct in claiming to be the only man of his time, in England or beyond the Sea, who could terminate this tragedy.

He advised his fellows to cultivate modesty, charity, and a studious and chaste mode of life, just as his predecessors had done, but he gave much more detailed instructions to this effect than did the earlier writers. Charity was to be displayed by visiting "poure men," the benefit to the leech being "that thai by their prayers may gete him grace of the holy goste." In visiting the "poure men," however, the leech was not to let his high-mindedness obscure the realities, if we may judge from a general medical treatise of John's. In this he recommended for the treatment of constipation a brew which was really the equivalent of beef-tea, "if he be rich." Then he goes on and adds, "but if he is a pauper he may just drink his own urine." Chastity was enjoined most sternly. The leech was advised to abstain from all harlotry, and he was to be particularly careful in his conduct towards the wives, daughters, and other women in the household of his patients. He gave other advice to physicians which is used elsewhere in connection with similar matter.

John of Mirfield, the third member of this fourteenth-century trio of Englishmen known as the Three Johns, was a priestly scholastic keenly interested in medicine and to a less extent in surgery. The date of his birth is not known, nor is it certain whether he ever received any regular medical education. He composed the BREVIARIUM BARTHOLOMEI, a medical work, probably between 1380 and 1395.

In the Breviarium are some clinical tests of prognostic significance: "If the right eye of a sick man sheds tears, he will die; in the case of a woman, this applies to the left eye. The sole of a patient's right foot should be anointed with lard, which lard is then thrown to any given dog; if the dog eats it without vomiting, the patient will live, but if the dog returns it or makes no attempt to eat it, the patient will die." Mixed up with these mystic and messy investi-

gations is much sound medicine, and even more common sense. For example, if there is any doubt as to whether a person is or is not dead: "apply lightly roasted onion to his nostrils. If he is alive, he will immediately scratch his nose."

John of Mirfield takes the opportunity of expressing some criticisms, which seems to show that all was no more well with medicine and surgery then than it is today. He indicts first the quacks, and also "what is worse, and is considered by me more horrible—worthless and presumptuous women, usurp this profession to themselves and abuse it." Writing on the attitude to be adopted towards the women of a patient's household, John of Mirfield, the cleric, is not unnaturally less blunt than John of Arderne, the surgeon. He simply suggests that it is not consistent with professional dignity to "speak shamefully to them, or turn bold glances upon them."

According to John of Mirfield "modern physicians" possess three special qualifications, and these are: "to be able to lie in a subtle manner, to show an outward honesty, and to kill with audacity." Perhaps even more crushing is: "the physician if he should happen to be a Good Christian, which rarely chances."

John of Mirfield expressed the following in rhyme:

"When Physick's dearly bought, it doth much healing bring,
But when 'tis freely given, 'tis ne'er a useful thing."

HOSPITALS IN THE MIDDLE AGES

The first important hospital of western Europe was founded at Fabiola about the year 400. Its purpose, in the words of St. Jerome, was "to gather in the sick from the streets and to nurse the wretched sufferers wasted with poverty and disease." This hospital and the many that came after it extended hospitality to the sick.

The name "hospital" comes from the same Latin source as "hospitality." The word was carried into the English language and either in that form or more commonly as "spittle house" was applied to all institutions of refuge; those that cared for the sick and also those that housed the paupers and insane. It is only in recent times that "hospital" has come to signify a place where the sick receive temporary aid and shelter.

The hospitals of medieval Europe were dark, crowded, and insanitary buildings into which all classes of the destitute were received without discrimination. The inmates were given food, shelter, and religious admonition, but no medical treatment.

MEDICINE IN EUROPE IN THE FIFTEENTH AND SIXTEENTH CENTURIES (THE RENAISSANCE)

CHAPTER VII

WHEN WRITTEN RECORDS WERE BEGUN IN ENGLAND ABOUT A. D. 1500, THE MASSENGILL FAMILY EMERGED FROM ANTIQUITY IN THE PERSON OF WILLIAM MERSYNGALE, RECTOR OF THE CHURCH OF WEL-BURY IN THE DIOCESE OF YORK, ENGLAND, WHOSE WILL WAS MADE SEPTEMBER 15, 1472, AND PROBATED OCTOBER 17, 1472. AS HE WAS PROBABLY AN OLD MAN WHEN HE MADE HIS WILL SO SHORTLY BEFORE HIS DEATH, IT IS LIKELY THAT HE WAS BORN ABOUT A. D. 1400.

We have now reached the end of what is known as the Medieval Period and emerge upon the period called the Renaissance. However, it must not be imagined that the coming of the Renaissance in the fifteenth century at once meant a brighter and better world. The generation which lived with one foot in the Middle Ages and the other in the Renaissance, did not realize it was straddling two epochs. The children of the Middle Ages who became the fathers of the Renaissance were not conscious of any abrupt break with the past. Agreement is general that the sixteenth century marks the beginning of modern medicine.

At the beginning of the Renaissance medicine was still on a very low plane in England and it was a long climb to modern medicine. Herb-doctoring, quackery, superstition, were parts of the physician's stock in trade, and through soothsaying and the intricate pseudoscience of amulets they intrigued the unsuspecting populace. Uroscopy was a popular art, and consisted in diagnosing disease by gross visual inspection of the urinary output of the patient. Gracious lords and masters engaged special physicians-in-ordinary, to make matutinal inspections of this urine, for prophylactic purposes.

The physicians in London were incorporated into a society in 1518, and in 1540 the barber-surgeons were similarly incorporated.

In the fifteenth century, as before and afterward, purgation was the strong fort of therapy. According to an old saying:

"Know in beginning of all sharpe diseases,
"Tis counted best to make evacuation."

Evidence of the importance which physicians have always attached to purgation is the fact that the first medical book ever printed was a LAXIERKALENDAR in 1457. There was a great deal of nonsense connected with the giving of purges, which continued well into the seventeenth century. Reliance was still placed on the horoscope, and medical practice had not entirely got away from the purgation calendars of the Middle Ages, which indicated under each sign of the zodiac the proper time to administer the cathartic and often forecast awful happenings that were to befall humanity under the various planetary conjunctions.

VENEREAL DISEASES

Jacques de Bethencourt thought a disease should be named according to its cause, hence Venereal disease (*morbis venereus*). Unfortunately for the patients for several centuries syphilis and gonorrhea were usually considered the same disease, or at least that there was a close connection.

In the mid-sixteenth century Brasavolus wrote a book, which was one of those books which should have been left unwritten. For Brasavolus dealt with gonorrhea, not as a distinct disease, but as a complication of syphilis. Others took up the error and the misconception spread everywhere. This erroneous idea of the identity of gonorrhea and syphilis was overthrown by Philippe Ricord in 1838. Ricord was born in Baltimore, Maryland, but studied and practiced in Paris. As a result of his professional experiences he was pessimistic in regard to the morality of the human race and he was outspoken in his pessimism. Oliver Wendell Holmes said he was the "Voltaire of pelvic literature—a skeptic as to the morality of the race in general, who would have submitted Diana to a treatment with his mineral specifics and ordered a course of blue pills (mercury) for the vestal virgins."

Girolamo Fracastoro published in 1530 a medical poem—"Syphilis or on the Gallic Disease." In this poem, Syphilus, the shepherd of King Alcithous of Hayti, enraged at a prolonged drought which causes his flocks to perish, denounces the sun-god and worships his master Alcithous instead, claiming, "At least he will guard our flocks, will lead them to cool shelter and green shades." It was natural enough for a herdsman to speak in this fashion, but Apollo never overlooked an insult to his godhead: "At once upon this criminal earth there arises an unknown plague. Syphilus is the first attacked by it, for he was the first to profane the sacred altars."

Fracastoro, no doubt, derived the name Syphilus from Ovid's Sipylus—Sipylus being one of Niobe's children destroyed by the angry Apollo. Fracastoro's poem gave syphilis the name by which it has since been known. He referred to this new disease as the "love-pestilence."

Fracastoro's fame does not rest entirely on his poem, for he recognized the contagiousness of tuberculosis, the specific characters of fevers, the clinical entity of typhus, and has other accomplishments to his credit.

Syphilis, under the name of evil pocks, was first mentioned in print, on August 7, 1495, in the Edict of the Emperor Maximilian, who believed syphilis was sent by God in punishment for blasphemy. We may never know the date of the disease which has corrupted the blood of the human race—we know only that at the threshold of the Renaissance a new and terrible malady doomed all Europe, impartially attacking cardinals, kings, and peasants.

In the middle of December, 1494, when Charles VIII was invading Naples, syphilis broke out in the French army. Must we agree with Diaz de la Isla, Oviedo, Fallopius and Montanus, that syphilis was imported by the Spaniards from America? Was it possible for the returned crew of Columbus, even if all its members were immoral, to cause an epidemic of such proportions? Or shall we rather agree with Leonicensio that syphilis is of ancient lineage, and was referred to by Hippocrates himself in the aphorism, "ulcerations of the mouth and mortification of the privy members?" Upon the other hand, the in-

quiry has been made, "If syphilis in Europe existed before Columbus, why are we unable to find a single syphilitic bone of pre-Columbian origin?"

John of Vigo mentions the date of the first appearance of the French evil, does not confuse it with gonorrhea, and was among the first to recommend mercury for the treatment of syphilis. The name of this surgeon survives not in connection with any operation, but in a diachylon plaster and an orange-red powder.

Guy de Chauliac, the dominant surgical figure of the fourteenth century, popularized scorpion oil as a diuretic in venereal disease. Long afterward a medical traveler tells of meeting a convoy of ten mules, all heavily laden with living scorpions—a significant sidelight on the prevalence of gonorrhea.

Casanova, the libertine, was told by a surgeon that he was indebted to him for his present comforts, and when he inquired why, the surgeon stated: "In this way, captain. You had a connection with Don Jerome's housekeeper, and you left her, when you went away, a certain souvenir which she communicated to a certain friend of hers, who, in perfect good faith, made a present of it to his wife. This lady did not wish, I suppose, to be selfish, and she gave the souvenir to a libertine, who in his turn was so generous with it that, in less than a month, I had about fifty clients."

From the twelfth to the fifteenth century Europe was visited by frightful plagues that gave the exhausted people scarcely any time for recovery. Black Death and smallpox ravaged them; measles was more destructive than it is today; leprosy spread widely, and those afflicted were torn from their families and banished by Biblical precedent from human society. The disease of Saint Anthony's fire, now almost forgotten, was the dread of town and country—a withering, deforming disease that left behind it crippled bodies.

BLACK DEATH

In the years 68 and 79 A. D. outbursts of Black Death, now recognized as bubonic plague, occurred at Rome. The disease raged again in 125 and 164 A. D., and after the later date continued without interruption for sixteen years. This period which Bibbon regarded with envy commenced with a plague which at its height killed ten thousand persons in a single day. Tacitus, the Roman historian, who saw these events, says: "The houses were filled with dead bodies and the streets with funerals." It spread slowly up the Nile; it crept into Asia Minor. It reached Constantinople; there at its height it killed five to ten thousand inhabitants daily. During the fourteenth century it is said to have destroyed in China 13,000,000 of the population, and in the other Eastern countries 24,000,000 more. The loss by death from the plague in Europe only was over 25,000,000.

It continued to recur in Europe, with greater or less severity, for 350 years, or until the end of the seventeenth century. As late as 1630, it killed 500,000 in the Venetian Republic, and during the plague of London, 1665, more than 1,000 died each week. Nearly one-fourth of the population of Europe died of the plague.

In Paris, the learned doctors of the university said that the plague is caused by a "corruption of the atmosphere," caused by malign conjunctions of the

planets over the Indian Ocean which have been spread over Europe by "heavy and turbid southerly winds."

SMALLPOX

For many centuries the ghost of smallpox terrorized our forefathers. Plagues came and plagues disappeared, but smallpox was never absent. It was the vastest horror that decimated the human race. No mother counted her children until all had passed through smallpox. In those days the young men sighed, "Oh, for a mistress who is not pock-marked." None were so lowly as to be passed by without notice, none so powerful as to enjoy immunity. After the Spaniards brought the scourge of smallpox to America, the empire of the monarch of diseases was universal.

Today, if a ruler or a prominent statesman were to die of smallpox or even have the disease, it would be a scandalous occurrence. Yet before Edward Jenner's announcement of the discovery of vaccination in 1798, the presence of smallpox was not a sign of ignorance or neglect. The disease was inevitable; men were defenseless against it. Louis XV was one of a long line of kings, queens, and princes who died of the disease. Perhaps the most pathetic lines written about the disease are in the epigram that Ben Johnson dedicated to it three hundred years ago—a hopeless protest against the inevitable:

"Envious and foul disease, could there not be
One beauty in an age, and free from thee?"

A young apprentice at Sodbury overheard a country-girl say, "I cannot take the smallpox, for I have had the cowpox." Edward Jenner pricked up his ears with interest, for he remembered that the farmers and dairy-girls of his native Gloucestershire had the same notion. He never forgot the remark. After reflection and experimentation extending over a long period, Jenner was ready for the test. A dairy-maid named Sarah Nelmes, who had been pricked by a thorn, and became infected with cowpox while milking her master's kine, was his medium. On the fourteenth of May, 1796, Jenner took matter from her hand and inserted it by two superficial incisions into the arm of James Phipps, a healthy boy of eight. This was the first vaccination. On the first of the following July, virulent smallpox matter that would have killed any unprotected lad in the world was introduced into his arm, but without the slightest effect, for Phipps had been vaccinated. This was the crucial experiment. The work of twenty-five years was over, and Jenner knew he had closed a gate of death.

Dr. Benjamin Waterhouse of Boston was the first physician to use vaccination in America. In 1802 he vaccinated seven of his children; later he took them to the pesthouse and exposed them to smallpox, but none acquired it.

He even carried the proof of protection further than Jenner. He vaccinated nineteen boys. Twelve of these he afterward inoculated with smallpox matter and at the same time and with the same manner he inoculated two boys who had not been vaccinated. The twelve remained free from the disease; the two unvaccinated boys fell ill with the smallpox.

Thomas Jefferson was our first American President to be vaccinated, and the principle had been discovered then only three years before.

SCURVY

Sir Richard Hawkins stated, in the latter part of the sixteenth century, that he could give an account of ten thousand men who had been destroyed by scurvy in the twenty years that he had been at sea.

The sailor whom Holmes says taught "how to keep off the scurvy" was Captain Cook, the discoverer of the Hawaiian Islands.

ANTIMONY

In the sixteenth century the salt of antimony, tartar emetic, was introduced into medicine as an emetic and purgative and on account of its being a poison was the source of much discussion. A century may inherit a feud in the same manner that a family does. The sixteenth century handed down to the seventeenth century the quarrel about antimony.

Paracelsus had used antimony under the name of stibium, but later the name was changed and the drug popularized by a medical book published in 1604. The origin of the name antimony as given in this book is as follows: The author alleges that he had observed that some pigs which had eaten food containing antimony became very fat. He was led by this observation to try what effect it would have on some monks who had become emaciated as a result of prolonged fasting. He tried the experiment; the monks all died. Hence the name stibium was replaced by antimony, meaning antagonist to monks.

The most interesting of Basil Valentine's books, and the one which has had the most enduring influence, is undoubtedly *THE TRIUMPHAL CHARIOT OF ANTIMONY*. It has been translated and has had a wide vogue in every language of modern Europe. Its recommendation of antimony had such an effect upon medical practice that it continued to be the most important drug in the pharmacopoeia down almost to the middle of the nineteenth century.

TOBACCO

Tobacco was introduced into pharmacy by Jean Nicot in 1559, and for some years it was advocated as a remedy of almost universal potency. Harriot lauded the healthful qualities of tobacco, "which purgeth superfluous fleame and other grosse humors, openeth all the pores and passages of the body: by which meanes the use thereof, not only preserveth the body from obstructions; but also if any be, so that they have not beene of too long continuance, in short time breaketh them: whereby their bodies are notably preserved in health, and know not many greivous diseases wherewithall wee in England are often-times afflicted." Smokers swore it was an "antidote to all poisons; that it expelled rheums, sour humours, and obstruction of all kinds, and healed wounds better than St. John's wort." Some doctors were of opinion it would heal gout and the ague, neutralize the effects of drunkenness and remove weariness and hunger. It had a very stormy career as a drug, and is now mainly used as an insecticide.

The physicians of the sixteenth and seventeenth centuries apparently tried to make the deaths of their patients as unpleasant as possible; when Cardinal Richelieu was on his death-bed a female charlatan prescribed for him a mixture of horse dung in white wine, and the cardinal drank it. In the eighteenth

century Fauchard, a Frenchman who made notable contributions to dentistry, advised his patients to use their own urine as a mouthwash in case of tooth-ache. Urine was an old remedy, but subject to occasional revival; Madame de Sévigné recommended it highly in the seventeenth century.

The forerunner of the modern Chic Sales was Sir John Harington, a godson of Queen Elizabeth, who invented the modern water-closet, which he described under the heading of "A New Discourse of a Stale Subject called the Metamorphosis of Ajax" (London, 1596). A "jakes" was the accepted term for a privy in Elizabethan days. His invention constituted one of the few sanitary innovations that came before the nineteenth century. Its general adoption was slow. A new epoch in the practice of medicine began in 1777, when John Howard published in England his famous books on the sanitation of prisons, hospitals, and quarantine stations.

The medical school at Salerno had produced one of the most popular medical books ever written, *REGIMEN SANITATIS SALERNI*. Sir John published an English version. The two most quoted couplets in his version of the *REGIMEN* are probably:

"Use three physicians still: first Doctor Quiet,
Next Doctor Merry-man, and Doctor Dyet."
"Joy, Temperance, and Repose,
Slam the door on the doctor's nose."

About the only reference he made to surgery was that it is "that skill which death loves not." The rest is amusing rhyming advice on food and drink and the use of herbs.

Sound common sense and purely Elizabethan ribaldry are mixed throughout the whole of Harington's version:

"Great harmes haue growne, & maladies exceeding,
By keeping in a little blaft of wind:
So Cramps & Dropfies, Collickes haue their breeding,
And Mazed Braines for want of vent behind:
Besides we finde in ftories worth the reading,
A certaine Romane Emperour was fo kind,
Claudius by name, he made a Proclamation,
A Scape to be no loffe of reputation.
Great fuppers do the ftomacke much offend,
Sup light if quiet you to fleepe intend."

The reference to the Emperor Claudius is probably taken from Suetonius, who wrote that the Emperor had in mind at one time the issuing of a proclamation justifying the emission of flatus wherever and whenever the need might exist.

An advertisement of the sixteenth century period: "*Barnaby Factotum*: Draws Teeth, Bleeds and Shaves: Wigs made here; also sausages. Wash Balls, Black Pudding, Scotch Pills, Powders of the Itch, Red Herrings, Breeches Balls and Small Beer by the maker. In *utrumque Paratus*."

SIXTEENTH CENTURY

EMERGING FROM ANTIQUITY, WHEN THE OLDEST LOCAL RECORDS WERE KEPT, WE FIND MASONGILL HAMLET, LOCATED IN THE PARISH OF THORNTON IN LONSDALE, IN THE WEST RIDING OF YORKSHIRE, ENGLAND. AT PRESENT WE FIND MASONGILL HALL, BUILT EARLY IN THE TWENTIETH CENTURY, AND STANDING NEARBY, THE RUINS OF THE ANCIENT MASONGILL HALL, WHOSE MASTER IS LOST IN THE MISTS OF ANTIQUITY. AT WHITBY, ENGLAND, WE FIND GILBERT MARSINGILL, THE EARLIEST ANCESTOR WITH WHOM THE FAMILY IN THE UNITED STATES HAS BEEN DEFINITELY CONNECTED, AND WHOSE WILL WAS DATED AUGUST 26, 1592.

In the sixteenth century, which period marked the beginning of modern medicine, the Massengill family in England was still living in the Dogmatic or Empirical age of medicine and awaiting the coming of the Rational age, about the closing of the eighteenth century. It was a century of struggle and conflict, an almost constant battle between the vested doctrines of the past and the aspiring truths of the present.

Great developments in medicine were just ahead. The great Paracelsus became medicine's standard bearer; Vesalius, Eustachio, and Fallopio recast anatomy; Paré restored surgery to a worthy place; ophthalmology was recreated and obstetrics began to be a science and art rather than a murderous occupation.

PARACELSUS (1493-1541)

Paracelsus was one of the three outstanding physicians of the sixteenth century; the other two were Vesalius, who founded modern anatomy, and Paré, who reformed surgery. Paracelsus was the founder of the Chemical School of Medicine. He enlisted chemistry in the service of therapeutics as never before. He taught the use of sulphur, lead, antimony, mercury, iron, copper, in their various combinations. He was born in a small village near Zurich, Switzerland, in 1493, and died forty-eight years later at Salzburg. His real name was Hohenheim. He settled down as Professor of Medicine at Freiburg in 1525, for a short time, then was professor at Strassburg and finally became Professor of Medicine at Basel in 1527. His lectures were such as had never been heard before at a university. He began his course by burning the works of Galen and Avicenna in a chafing dish, and denouncing the slavish reliance on authority which at that time characterized medical teaching and practice. He attacked the authority of Galenic and Arabic medicine, pleaded for substituting meditation and thought for dogma, and fairly shouted anathema on outworn texts in such pronouncements as this: "Reading never made a doctor, but practice forms the physician; all reading is merely a footstool to practice, and a mere feather broom."

"The new professor did many astonishing things that day. Instead of using monkish Latin, he lectured in native German, which then seemed 'even to the German emperor, suitable only to address horses.' Paracelsus had with him a pile of books—the works of Galen, Avicenna, Averroes and other medical masters. It was surprising to see the iconoclast in company with the authorities. But Paracelsus did not quote from them. He placed some sulphur in a brazier, set fire to it, cast in the sacred volumes, and burnt up the idols."

"What will you think when I triumph? I am to be the monarch, and the monarchy will belong to me. For I tell you boldly that the hair from the back of my head knows more than all your writers put together; my shoe-buckles have more wisdom in them than either Galen or Avicenna; and my beard more experience than your whole Academy."

He was a giant in the field of therapy. He saw that medical education in his time was defective, and he started a modern revolution which eventually led to a complete upheaval in all departments of medicine. This vigorous, clear-thinking doctor saw that surgeons should practice asepsis. He said to them: "Do not touch wounds, because they cure themselves; it is the external agents which complicate processes of cicatrization." He likewise investigated the therapeutic properties of mercury and mercurial preparations and taught their remedial values and the diagnostic principles suggesting their uses.

Paracelsus, however, was several centuries ahead of his time. His contemporaries laughed at him and painted him as an irascible, boasting fool. Today we can fully appreciate his genius and see what an outstanding character he was in the history of medicine. No one man in history exercised such a revolutionary influence on medicine and pharmacy as this erratic genius.

During Paracelsus' travels he learned a great deal about medical practice, low company, and mysticism. The mystic views of Paracelsus, or those attributed to him, are curious rather than useful. He seemed to have had as much capacity for belief as he had disbelief in other philosophers' speculations. He believed in gnomes in the interior of the earth, undines in the seas, sylphs in the air, and salamanders in fire.

Paracelsus wrote a poem that his critics called "A Study of intellectual egotism." One author said of him: "Paracelsus was an egotist, without doubt. Indeed, egotism seems a ludicrously insignificant term to apply to his gorgeous self-appreciation."

Operinus, who lived with Paracelsus for two years, declared he was almost constantly drunk. He was scarcely sober two hours at a time. He would go to taverns and challenge the peasantry to drink against him. When he had taken a quantity of wine, he would put his finger in his throat and vomit. Then he could start again.

Paracelsus brought the manner of the tavern wine-room into his lecture-room. Within a year after his arrival at Basel he was in conflict with the city authorities and was brought to trial. After abusing the court roundly he fled from the city to avoid the consequences of his impudence. He resumed his wanderings, and in September, 1541, died as the result of an injury received in a drunken brawl at Salzburg.

ANDREAS VESALIUS (1513-1564)

There is not a name of greater renown in the record of professional characters than Andreas Vesalius, who was a native of Brussels, but the precise year of his birth is somewhat indefinite, being stated as April, 1513, and December, 1514.

Vesalius founded modern anatomy. He said in as many words that whatever the older authors had written about the skeletons and internal organs of

pigs or monkeys or horses, while true enough so far as horses or monkeys or pigs were concerned, was not necessarily true of the human organism.

When Vesalius was a student, human cadavera were still so scarce that he found it necessary to climb gallows or rob graveyards for material. So difficult was it to obtain a human corpse during the Renaissance that when Rondolet opened his anatomical course at Montpellier, he was forced to dissect the body of one of his own children.

It has been said that the Greek, Hippocrates; the Belgian, Vesalius; the Englishman, Harvey; and the Frenchman, Pasteur, are perhaps the four greatest figures in the history of the medical sciences. The first great contribution to anatomy was made by Andreas Vesalius in 1543. Vesalius actually dissected the human body and made accurate observations unblinded by veneration of Galen.

Vesalius was the anatomist who dethroned Galen, though he was not a conscious antagonist of Galen. Before Vesalius finished with the Prince of Physicians, he demonstrated and corrected over two hundred Galenian errors.

In giving birth to modern anatomy in 1543 Vesalius had exhausted himself and in the years following did nothing. He became court-physician of Spain. He took unto himself a wife, made money, and exchanged the intellectual life for the easeful one. He attended the licentious Don Carlos who tripped and broke his head while chasing a girl who ran away.

FALLOPIUS

Fallopius, the great anatomist who named so many anatomical parts, and a pupil of Vesalius, wrote a book. In a leisure moment Vesalius commenced to glance through the volume. A tinge of jealousy crept through his veins. The Father of Anatomy read of anatomical discoveries of which he knew nothing. While he had been dawdling away his days in the performance of petty functions, science had been advancing. He determined to quit the court of Spain, and once again devote himself to the pursuit of knowledge.

About this time a nobleman died of an obscure illness and Vesalius performed an autopsy. He and his associates found a beating heart. He was accused of impiety and murder and was sentenced to death. He escaped and went to Palestine. According to a less-known story, Vesalius was thus condemned because while dissecting the mistress of a priest he discovered unmistakable evidence that the bachelor had not kept his vows as to chastity. Still another version is that he took the journey to escape the vigorous tongue of his wife.

Fallopius died young, and the Venetian senate invited Vesalius to again fill the Paduan professorship thus made vacant. Upon his return a storm arose and the anatomist was wrecked. His corpse was found in a hut and it is believed he succumbed to typhus.

AMBROISE PARÉ (1510-1564)

Paré, of France, typified the highest type of medical mind of his time and he was a character of which any generation might be proud. He will be further mentioned in the chapter, Surgeons and Surgery.

MICHAEL SERVETUS (____-1553)

Michael Servetus, a classmate of Vesalius, a native of Spain, was somewhat of an erratic genius. He began the study of medicine at the University of Paris, under the direction of the celebrated anatomist, Sylvius, where in due time he graduated with honor. Later, he became a pupil of Guinterius, a man who had risen from the depths; he had stood in the streets of Deventer, imploring the passersby for bread. But hunger never prevented Guinterius from studying Greek, and the learned beggar became a professor in the University of Louvain.

Servetus published a learned medical work, *SYRUPORIUM UNIVERSA RATIO*, in which from a therapeutic and physiological standpoint he criticized Galenism and Arabism, and mixed too much theology with his medicine. His book was a distinct advance in the art of prescribing. For the nauseous mixtures—the mere names of which now act as emetics—he introduced more palatable drugs; in these pages we see the first rational attempt to avoid incompatibilities, and we find also the first suggestion of what the pharmacist calls vehicles. 26

His book aroused bitter antagonism. The Faculty of Paris attempted to impeach him. Dissensions divided the university, riots occurred in the streets, and some of the students were severely injured. Servetus was imprisoned and Calvin labored for a death-sentence.

On October 27, 1553, Calvin's tribunal read the following judgment: "Because in his book he calls the Trinity a devil, and a monster with three heads; because contrary to what Scripture says, he calls Jesus Christ a Son of David; and says that the baptism of little infants is only an invention of witchcraft; and because of many other points and articles and execrable blasphemies with which the said book is all stuffed, hugely scandalous and against the honor and majesty of God, of the Son of God, and of the Holy Spirit . . ."

The following is part of the sentence: "By this our definite sentence which we give here in writing, we condemn thee, M. Servetus, to be bound, and led to the place of Champel, there to be fastened to a stake, and burned alive, with thy book, as well written by thy hand as printed, even till thy body be reduced to ashes, and thus wilt thou finish thy days, to furnish an example to others who might wish to commit the like."

Green wood was used to prolong the agony; to mock him, a crown of straw dipped in sulphur was put upon his head. By his side they tied the book that should have made an epoch.

Thus perished one of the most original thinkers of the sixteenth century; a man who was fully three centuries in advance of the age in which he lived; the discoverer of the pulmonic circulation of the blood; condemned to death for writing the book that contained the most momentous physiological discovery of the time.

LEONARDO DA VINCI

Leonardo da Vinci dissected many bodies for the acquisition of anatomical knowledge, and was the first who drew accurate pictures, including the human skeleton, of these dissections. He is the real Father of Modern Anatomy. He was an illegitimate child, left-handed and unsexed.

Leonardo followed criminals to execution to observe their fear-distorted features, and likewise in the interests of his Art he studied corpses—until the Pope excluded him from the Roman hospital as "a heretic and cynical dissector of cadavers."

VELERIUS CORDUS

Velerius Cordus, a great botanist of this period, died of malaria before he reached his thirtieth year. He examined plants in the forests of Germany and Italy and described 500 species of plants which were unknown to Dioscorides, the father of materia medica. He is of further interest to us from his connection with the discovery of ether, as the author of the first accurate description of nux vomica, and as the compiler of the NUREMBERG DISPENSATORIUM, which is regarded as the first official pharmacopoeia.

One of the quatrains of Euricius Cordus, a botanist of the period, has survived among the medical fraternity:

"God and the doctor we alike adore
When on the brink of danger, not before;
The danger past, both are alike requited,
God is forgotten and the doctor slighted."

The earliest botanist of the Renaissance was Niccolo Leoniceo. His countryman Monardes published the first accounts of jalap, sassafras, cebadilla, sarsaparilla, balsam of Tolu and balsam of Peru.

WILLIAM GILBERT, in a published book, was the first to mention the word electricity. Before Gilbert the twin forces of electricity and magnetism still slumbered in darkness. His studies refuted many of the fables of that time, such as the belief that the lodestone can reconcile quarreling husbands and wives; that there are northern mountains of such magnetic power that they extract nails from the timbers of passing ships; that when a magnet is rubbed with garlic it ceases to attract iron; that if pickled in the salt of a sucking fish it will pull up gold from the deepest wells.

While the great scientific advances were being made during the Renaissance much bad doctrine was still being disseminated:

CORNELIUS AGRIPPA sowed the seeds, throughout all Europe, of a doctrine fully as degrading as the demonology of the ancient Egyptians during the mythological age. He believed that everything in nature was the habitation of demons—air, fire, water, land, men, animals, etc. He believed that these demons were the cause of all diseases, and, of course, the treatment prescribed in accordance with that view was necessarily absurd in the same degree. He died at Grenoble, in 1535 A. D.

JEROME CARDAN was another eminent disciple of Cabalistic medicine. He was born at Pavia, in 1501 A. D. He taught that the different parts of the body are under the dominion of different stars. He records the most extravagant stories, visions, dreams, sorceries, etc., and explains them by means of the cabal. He died at Rome in 1576 A. D.

We have now come to the end of the sixteenth century, a great period, to many the greatest century of all in the interest of its happenings and the remarkable characters which it produced. The Renaissance was the period of great reformers—Luther in religion, Vesalius in anatomy, Paré in surgery, and Paracelsus in therapy.

MEDICINE IN EUROPE IN THE SEVENTEENTH CENTURY

CHAPTER VIII

DANIEL MARSINGILL, GREAT-GRANDSON OF GILBERT MARSINGILL, AND WHO WAS THE ANCESTOR OF THE MASSENGILL FAMILY IN THE UNITED STATES, "AGED NEARE EIGHTEEN BEING NOW BOUND OUT TO SEA," MADE HIS WILL JANUARY 18, 1645, AND IN 1653 SETTLED IN THE COLONY OF VIRGINIA, IN THAT PART WHICH LATER BECAME CHARLES CITY COUNTY.

In the seventeenth century began the practice of medicine and pharmacy in America. Medicine in America, which was not greatly different from the practice in Europe, will follow in a separate chapter.

When the earliest written records were begun in England in the fifteenth century the Massengill family was there, and they continued to witness the progress of medicine and pharmacy in England and the United States throughout the later centuries.

The seventeenth century was notable for improved instruments, yet the surgical achievements were not great. The gulf between physician and surgeon was not yet bridged: the physician scorned to think surgically, and the surgeon feared to trespass on medicine.

At this period, although the Grocers were the recognized drug-dealers in England, apothecaries who were associated in their Guild were also recognized. The Act of 1511 incorporating the College of Physicians and giving them the exclusive right to practice physic in London and for seven miles round, was largely used, if not intended, against apothecaries.

The Grocers' Company seceded from the Apothecaries Guild and the feeling between these, and also between the physicians, became very strained. The quarrel ended in the comparative triumph of the apothecaries.

Witchcraft was the black magic of the Middle Ages. The persecution of witches, which caused the deaths of thousands of innocent children and old women, developed on an enormous scale in Europe in the fifteenth century, and reached its height in Europe and the United States in the seventeenth century. Witchcraft is the exact opposite of faith healing; instead of inspiring health by faith, witchcraft inspires disease.

There were witches in the primitive world, and in the first civilizations; in the early middle ages, Augustine declared that witches indulge in sexual intercourse with the devil, and it is impudence to deny it; the two greatest theologians of the latter middle ages, Albertus Magnus and Thomas Aquinas, were firm believers in witchcraft. Witchcraft was a child of the theologians rather than of the physicians.

In the English colonies men began to appear in court, charged with kissing Satan under the tail, and in giving him four of their hairs in exchange for diabolical knowledge; women were accused of making men impotent with an ointment, and of riding through the air on a broomstick to attend the Witches' Sabbat.

Not the dark ages, not medieval times, but the enlightened seventeenth century was the Era of the Witch Hunt.

In the seventeenth century the curious theory of telegony—the first male who fecundates a female makes such an indelible impress upon her that subsequent offspring by another man bear the characteristics of the first father—was well known.

The seventeenth century seems to have been the period of the earliest activities of the grave-snatchers or resurrectionists as they were called. The teaching of anatomy demanded a continual supply of bodies, or subjects, for dissection. A few subjects were legally available for dissection, but the legitimate demand was always greater than the legal supply. Edinburgh, which took the lead among the English schools, did not have a skeleton until 1697.

Four gypsies were executed for murder in Edinburgh in 1678 and their bodies were flung into a common grave. Next morning the topmost of the four corpses had disappeared. This is the first record of surgeons having recourse to an unofficial source of supply for anatomical subjects. But however much or however little the supply of anatomical material was increased, the demand outpaced it, and the Edinburgh College of Surgeons in 1711 placed on record the fact that "of late there has been a violation of sepulchres in the Grey Friars Churchyard."

Ten years later, as a sop to growing public indignation, all Edinburgh apprentices had a clause in their indentures to the effect that they were not to violate graves.

The notorious Dick Turpin was hanged at York in 1739. The corpse was allowed to lie in state at the local Blue Boar for twenty-four hours, and was then buried in an unusually deep grave. This did not prevent its being resurrected, but a hue-and-cry was raised and the disinterred Turpin was found in the garden of a surgeon's house. The second interment was successful. The coffin was filled with unslaked lime, buried even more deeply, and relays of watchers guarded the grave. This unsuccessful attempt at resurrection for dissection attracted a great deal of attention, as did more successful sallies, for by this time apprentices and their masters all over the country were going forth in the dead of night to collect the anatomical material that they could obtain in no other way.

In 1751 it was enacted that all murderers executed in London and Middlesex should be either publicly dissected or hung in chains on gibbets. This Act materially increased the supply of subjects for dissection, but still there were not nearly enough. Apprentices went on raiding the graveyards.

There came to light another source of supply. In many districts at that time it was customary to "wake" the dead—that is, the relatives kept vigil over the coffin for the few days that elapsed between death and burial. The rite was losing favor, however, and the bereaved relatives were often very willing to pay the nurse who had attended the dear departed a few pence for continuing to keep an eye on an erstwhile patient. Two women, Helen Torrence and Jean Waldie, made this work their specialty, and as a profitable sideline abstracted from their coffins the bodies they were supposed to watch and sold them to anatomical students.

Later, many murders were committed to obtain the bodies for sale.

In this century John Floyer was the first to count the pulse with the minute watch. William Harvey, the English physiologist, had emphasized the value of the pulse in medical diagnosis, and also suggested the use of the watch in counting the pulse.

Prof. Carl Binz called attention to the fact that more than a century before the birth of either Floyer or Harvey, a distinguished German churchman, who died shortly after the middle of the fifteenth century, had suggested a method of accurate estimation of the pulse that deserves a place in medical history.

SANTORIO SANTORIO (1561-1636) said it was much more important to determine the frequency of the pulse, to count the number of beats within a specified time. This is done today with the aid of a watch. But the timepieces that existed at the end of the sixteenth century had no second hand. Santorio, therefore, constructed a special instrument for readings of the pulse, a "pulsilogium."

Santorio was the first man to invent what we now call a "clinical thermometer." This first of clinical thermometers was a primitive instrument. The globular expanded end of a convoluted capillary glass tube (graduated) was placed in the patient's mouth. The other end of the tube dipped into a vessel filled with water. The temperature was estimated from the amount of warmed air that was expired.

It was during the seventeenth century that the microscope was discovered—an instrument which opened new horizons to the anatomist's eye. The microscope was perfected through the efforts of the Hollander, Cornelius Drebel (1621) and the brothers Janssen of the Netherlands (1608). Anton van Leeuwenhoek (1632-1723), a great microscopist, was the first one to apply the microscope in the study of medicine, though he himself was not a physician.

RICHARD LOWER (1631-1691), an English practitioner, was the first to do a direct blood transfusion from one animal to another (1665). Frederik Ruysch (1638-1731), a Hollander, perfected the method of injecting blood vessels, and a great number of anatomical and histological discoveries were made during this period.

UROSCOPY

From time immemorial the urine has been naturally the subject of medical interest. As practiced in this century it was known as Uroscopy, or "water casting." The urine, usually in a flask, was brought to the physician, who held it to the light with solemn and judicial air, while he read the patient's fate in the unlifted urinal.

"Red Urine signifieth heat of the blood; white, rawness and indigestion in the Stomach; thick, like puddle, excessive labor or sickness; white or red gravel in the bottom threatens the Stone in the Reins; black or green, commonly death."

Molère's Flying Doctor depicts the seventeenth century physician engaged in a urinalysis:

"This urine shows a great deal of heat, a great inflammation of the bowels; it is, however, not so very bad."

"Gorgibus—'Eh, What-Sir, are you swallowing it?'"

"Scanarelle—'Do not be surprised at that, doctors, as a rule, are satisfied with looking at it; but I am a doctor out of the common, I swallow it, for by tasting it I discern much better the cause and the effect of the disease. But, to tell you the truth, there was too little to judge by; let her make water again!'"

Uroscopy, as practiced, continued into the eighteenth century, and love-sickness and female chastity were still diagnosed by a naked-eye examination of a jar of urine held up to the sun. A survey of the medical literature of that time conveys the impression that with the exception of gout, the most prevalent disorder was stone in the bladder. Alkalis were regarded as the remedies, and the leading scientists concerned themselves with the problem.

A great many new remedies came into use in the seventeenth century, some good and some bad, and at the same time, most of the older ones were continued. Of great importance was a bark that had been brought over from Peru. Cinchona, as this drug was called, had long been used by the Peruvian Indians as a cure for fevers. It was brought into Europe as a secret remedy by the Jesuits in 1632, and later by Juan del Vego, physician to the Count of Chinchon.

A lady's ague was responsible for a medical revolution. Ana, Countess of Chinchon, living in Peru which her husband ruled as viceroy, lay ill with malaria. Thus the fascinating story of quinine being introduced into England with all the necessary elements of adventure, such as Peru, Jesuits, English nobility, a sick countess and the cure of cardinals.

✓ THEODORE TOURQUET, about 1600, a Swiss by birth, who lived in France, wrote a treatise advocating the use of mineral medicines, particularly the antimonials and mercurials. This position, and also the fact that he was a Huguenot, made him unpopular in France. He moved to England, took the name of Mayerne, and was appointed chief adviser to the King and Queen. Mayerne did not, however, confine his medicines to those of chemical origin. He was tinctured with the same credulity which pervaded medicine for hundreds of years, regarding the efficacy of certain animal remedies of disgusting character. The principal ingredient in a remedy for the gout which he frequently prescribed, was the raspings of a human skull of a person who had not been buried. He is also said to have devised an ointment for hypochondria called Balsam of Bats. This contained bats, adders, new born dogs, earthworms, hogs' grease, stagbone marrow, and the thigh bone of an ox.

About this same time a physician named Besnier was expelled by the Paris Academy of Physicians for having administered antimony to a patient. The Galenists and Paracelsans had another battle in France in 1643 in which the former won another temporary victory in again having the use of metallic salts in medicine prohibited.

In the seventeenth century there was more exact knowledge of poisons than of medicinal drugs. The medical properties of drugs could not be correctly estimated until scientific methods were developed in the eighteenth and nineteenth centuries.

Usnea was particularly an English drug. It consisted of the moss from the skull of a man who had died a violent death. It was obtainable in England because those were the days when the bodies of criminals who had been executed were suspended in chains at cross roads and in public places as a

warning and deterrent to other criminals. This exposure was conducive to the growth of moss on the skull. The skull itself was also used in medicine.

In the seventeenth and eighteenth centuries coral and pearls were considerably used in medicine in the form of magisteries, tinctures, syrups, and arcanas. Pearls were used in medicine until the eighteenth century, when it began to be suspected that chalk had the same effect. Emeralds had a great reputation, especially on account of their moral attributes. They were cold in an extra first degree, so cold that they became emblems of chastity, and curious tales of their powers in controlling the passions were told. They declared that the diamond rendered men fearless, that the ruby took away idle and foolish fancies, that the emerald resisted lust, that the amethyst kept men from drunkenness and too much sleep, and so on.

This was the century in which the pile *perpetuoe* was used. This was a pill of metallic antimony which could be used over and over again as a cathartic. One of these would serve a whole family during its lifetime and then could be transmitted as an heirloom to posterity.

The sympathetic powder was originally introduced into Europe in the seventeenth century by a friar who obtained it in the East. The wonderful sympathetic powder was copper sulphate or blue vitriol. The sympathetic powder had its prototype in ancient Rome when poculi or "cups" were prepared—the *poculum amatorium*, or love draught, brought the seller, upon discovery, a decree of condemnation. Pliny states that in this period they not only used philtres for promoting love, but also philtres for quenching love.

✓ THOMAS SYDENHAM (1624-1689), originator of modern internal medication, was born in the year 1624, at Wynford Eagle, in Dorsetshire, where his father, William Sydenham, had a large fortune which became of great advantage to his brilliant son.

Sydenham was one of the great first fruits of the scientific medical schools in England. He studied medicine at Oxford and Cambridge, and then took postgraduate courses at the University of Montpellier, France. He began practicing in London in 1666 and at once demonstrated that in ability, skill, broadness of knowledge and forcefulness, he stood out, not only beyond all other physicians in England, but in Europe. Sydenham was the most distinguished doctor of the seventeenth century. He has been called the English Hippocrates and the Prince of Physicians.

Sydenham was not a distinguished man of science, had not been a professor at a university, nor a voluminous writer. His collected works comprise no more than one volume of moderate size. He was merely an outstanding London practitioner.

Sydenham's reputation and his place in medical history rest solely on his genius as a clinician. When asked once by Sir Richard Blackmore as to the best books for medical reading, he replied, "Read DON QUIXOTE, it's a very good book, I read it myself still."

He popularized the use of cinchona bark, taught the value of diet and exercise and devised the opium mixture that still bears his name.

Sydenham paid the following tribute to opium: "Without it the healing art would cease to exist, and by its help a skillful physician is enabled to perform cures that seem almost miraculous."

His self treatment for gout and gravel was as follows: "In the morning, when I rise, I drink a dish or two of tea, and then ride in my coach till noon; when I return home, I moderately refresh myself with any sort of meat, of easy digestion, that I like (for moderation is necessary above all things), I drink somewhat more than a quarter of a pint of canary wine, immediately after dinner, every day, to promote digestion of the food in my stomach, and to drive the gout from my bowels. When I have dined, I betake myself to my coach again and when business will permit, I ride into the country two or three miles for good air. A draught of small beer is to me instead of supper, and I take another draught when I am in bed, and about to compose myself to sleep." We have since learned that this is the way not to treat gout.

A medical student, Thomas Dover, residing in Sydenham's house, had the smallpox—and later he told how the master treated him: "First I was bled to the extent of twenty-two ounces; then an emetic. I had no fire allowed in my room, my windows were constantly open, my bed-clothes were ordered to be laid no higher than my waist. He made me take twelve bottles of small beer, acidulated with spirit of vitriol, every twenty-four hours."

The theory of the transference of disease embraced the idea that disease could be transferred from one body to another. Snake bits, for example, were cured by enveloping the punctured site with a freshly bisected fowl. Even the great Sydenham exhibits the tenacious hold of this doctrine. This great clinician fell into the error of subscribing to the *methodus modenai morbos per accubitum junioris*, i. e., the method of curing disease in an old person by having him sleep with a vigorous young individual in order to bring about a transference of strength and health. Maybe the many old men who prefer young wives have heard of this doctrine.

After a life thus usefully employed, he died at his house in Pall Mall, on December 29, 1689, and was buried in the aisle, near the south door of the Church of St. James in Westminster. The College of Physicians resolved, in 1809, to erect a mural monument as near as possible to the place of interment, within that church, to the memory of this illustrious man. The title of "English Hippocrates" was of posthumous origin, for Sydenham never heard that pleasing designation. He was not a fellow of the Royal Society or of the College of Physicians, and he was not buried in Westminster Abbey.

✓ THOMAS DOVER of Warwickshire was a student of Sydenham who resided in his house. It has been suggested that after Sydenham treated him for smallpox Dover decided that pirateering was as safe as physic and became the terror of the Spanish main. On an adventurous voyage around the world, he anchored at the island of Juan Fernandez, taking on board its solitary human inhabitant—the immortal Robinson Crusoe; plundered the city of Guayaquil in Peru; combated a plague by making his sailors drink dilute sulphuric acid; sailed past the Cape of Good Hope, and reached home, loaded with wealth, in a Spanish prize. When he grew too old for buccaneering he practiced medicine and wrote THE ANCIENT PHYSICIAN'S LEGACY TO HIS COUNTRY, which contains his diaphoretic prescription of ipecac and opium, still popular as Dover Powder.

WILLIAM HARVEY (1578-1657), the discoverer of the circulation of the blood, was the most illustrious physician of the seventeenth century.

In the records of Padua there is still extant this entry in Latin: "William Harvey, son of Thomas Harvey, a yeoman of Kent, of the town of Folkestone, educated at the Canterbury Grammar School, aged 16 years, was admitted a lesser pensioner at the table of scholars, on the last day of May, 1593." On April 25, 1602, Harvey obtained from Padua the degree of doctor of physic, and returned to England to receive the doctorate in medicine from Cambridge.

We know little about Harvey himself, of his father we know less, and of his grandfather nothing at all. Harvey married the daughter of the physician Launcelot Browne, but he mentions her only in connection with her pet parrot which he post-mortemed. He had no children. In other words, William Harvey was without ancestry or posterity.

The importance of Harvey's work is all the more appreciated when one realizes that it was done before the microscope was in use. England knew nothing of many of the Italian anatomists, and thought but little of those few it had learned of. There were a few more bodies available for dissection than there had been, but the instruments of investigation were still far from precise. There were no watches with second hands, and time was still quite often reckoned by the interval between the beginning and end of a psalm.

Harvey's discovery of the circulation was the most important event that had occurred in medicine since the earliest rationalizing efforts of the ancient Greeks, and his discovery was the starting point of modern physiology. During the early portion of his career as a lecturer he began to demonstrate his discovery of the circulation of the blood to his classes, but did not publish it to the world until about ten years later.

THOMAS PARR

Dr. Harvey, at the King's request, performed a post-mortem on the famous case of longevity, Thomas Parr, born in 1483. One hundred and thirty years later, in 1613, he attracted attention because at that age he could thresh grain with a hand flail. His fame, however, did not grow to national proportion until 1635, when he was brought to the attention of Thomas Howard, Earl of Arundel, who took him up to London so that the King might see him. The rich food of the city so disagreed with him that he died of indigestion soon after reaching London in the hundred-fifty-second year of his life.

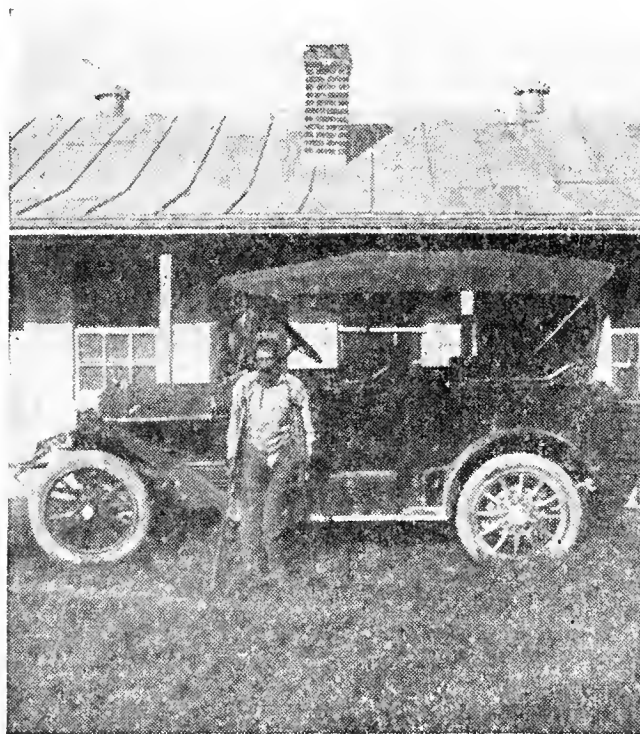
In his report on the autopsy of Thomas Parr, Dr. Harvey attributed his death to the change from a frugal diet of subrancid cheese, milk in every form, and coarse, hard bread, to the rich feeding he received in London, and to the change from the healthful air of the country to the foggy climate of the metropolis. He also dwelt on the important fact that by his leading such a peasant's life, free from care owing to its simplicity it contributed to his very advanced age; for, as the great Harvey pithily put it, "sorry fare, but free from care."

In a letter from Harvey, himself, to his nephew, published by the Sydenham Society, we find an account of the autopsy: "The body was in such a good condition in a man of 153 that the cartilages of the chest bones were not yet ossified." Harvey put it: "The cartilages were soft and flexible," black hair on the forearms, and the organs apparently healthy. Probably the fact that the testes, as Harvey says, "were sound and large," had something to do with it. He was also an affectionate husband, and to quote Harvey again,

"His wife told me that until twelve years ago he never ceased to embrace her frequently;" that is, when he was 140 years old! He had taken on his last wife in his one-hundred-and-twentieth year.

Old Parr has been accused of having committed a sexual offense in his 102d year, for which he was found guilty and punished.

Modern historical research has announced that his age is grossly exaggerated; that there may have been two Thomas Parrs, father and son, or uncle and nephew, whose overlapping lives have become confused. However, it does not seem reasonable that a mistake would have gone uncorrected at that time, in view of the court record when he was 102 years old, the King's interest, Dr. Harvey's interest, and his burial in Westminster Abbey.



William Murray (colored), who lived to be 112 years of age.

It appears to be natural for people to doubt the age of those who become extremely old, the following being a case in point:

William Murray (colored) lived to be over 112 years of age, the accompanying picture being taken when he was 110. He was born a slave in Eastern Virginia and remained one till his master voluntarily freed him and his other slaves. When a slave he had been a houseboy and carriage driver. Later, he would seldom go to the fields to work and when he did he was of no account, though industrious around the house and stables. As was usual with this class of slaves, he never had any respect for "damn niggers" that worked in the field.

He came to Tennessee in the 1840's in the employ of the stage company as a blacksmith's helper and an extra stage driver, and was a man of middle age at that time. His approximate age was confirmed by substantial people who had known him in Virginia. When he was 80 or 90 years old nobody doubted it, but when he became 100 years old nobody believed it.

He was the horseler in our family for many years. When he was 80 he fell through the hay-loft and broke several ribs. Mother took food to his cabin, and on returning announced amid much sorrow that this would be the last of poor old "Uncle Bill." He died March 18, 1917, having lived thirty-two years thereafter to make the world brighter.

"Uncle Bill" could not attribute his longevity to his good habits, for he smoked, chewed, ate vile messes, got on periodical drunks, and consistently violated every rule of correct living, except he did not over-eat. He called taking a drink of liquor "kissing my sister," did so till the end, and accompanied the act with a grimace that left no doubt of his enjoyment.

John Aubrey, the eavesdropper, whom Harvey met after he retired at the age of seventy-three, became his first biographer. Aubrey wrote very frankly of many prominent men of his time. Countless personal traits of the most eminent men of the seventeenth century would be lost, had they not been preserved for us by his prying disposition. He himself knew this and wrote: "How these curiosities would be quite forgott, did not such idle fellowes as I am putt them downel"

Other quotations from Aubrey are as follows:

"I have heard him say, that after his booke of the Circulation of the Blood came-out, that he fell mightily in his practize, and that 'twas beleevved by the vulgar that he was crack-brained; and all the physitians were against his opinion, and envyed him."

"I remember he kept a pretty young wench to wayte on him, which I guesse he made use of for warmeth-sake as King David did, and tooke care of her in his will, as also of his man servant."

Harvey died of gout, June 3, 1657. His whalebone pointer, tipped with silver, which he used in his lectures, is still preserved by the Royal College of Physicians, and his notes for these lectures are in the British Museum. They are written in a cramped hand, and very hard to read.

MARCELLO MALPIGHI (1628-1694), the father of histology, was an Italian by birth, was a professor at Bologna, Pisa and Messina, physician to Pope Innocent XII, and the greatest microscopist of his time.

Harvey's theory of the circulation of the blood was marred by a notable hiatus. He failed to discover how the blood made its way from the arteries to the veins. This discovery had been rendered possible by Malpighi by the discovery of the microscope. He was the first to discover the capillaries and thus supplied the missing link in Harvey's chain. Malpighi made many important histological discoveries.

ROBERT HOOKE, who published his MICROGRAPHIA in 1665, was the greatest of the English microscopists. He was a mechanical genius and invented many instruments and machines. It has been said of him: "His character was as unprepossessing as his body: he was too miserly to be immoral, but

he was crabbed, sour, jealous, vain, and morbid. All this must be admitted, but behind those unfriendly eyes and disheveled locks burnt the fire of genius."

JAN BAPTISTE VAN HELMONT (1577-1664) was a man of good family. Born in Brussels, he studied at the University of Louvain. Restlessly, discontentedly, he passed from one faculty to another. Botany led him to *materia medica*. Then he worked as assistant to a physician. "Soon, however, I became extremely rueful because in the curative art I found nothing to expect but dissatisfaction, uncertainty, and surmise. I could dispute concerning the medical art in connection with every disease, and yet I had no fundamental knowledge how to cure a toothache or the itch."

The domain of chemistry was very variously enriched by van Helmont's studies. He investigated the various substances having the physical qualities of air, and coined for them a new general denomination, gas. He disclosed their difference from (visible) steam; and he discovered carbonic acid, thus becoming the founder of pneumatic chemistry. Previous to his discovery chemists had no clear perception of a distinction between the various gases; they reckoned them all as air.

The closing years of van Helmont's life were harrassed. A small work of his in manuscript, directed against a Jesuit and discussing the magnetic treatment of wounds, fell into the hands of a stranger, was printed against his wishes, and attracted the unfavourable attention of the Inquisition. A charge was brought against him, and for a time he was imprisoned. An interminable trial dragged on. Van Helmont recanted, but this was of no avail during his lifetime, and he was not acquitted until two years after his death, the ground for the acquittal being that he had always led so pious a life.

FRANZ DE LE BOE (Sylvius) (1614-1672), sprang from a French Huguenot family which had originally been known by the name of Dubois, and had migrated into the Low Countries. War had driven his parents thence into Germany, so that Sylvius was born at Hanau. He studied in German and Dutch universities, and took his degree in medicine at Basle in the year 1637. Later he went to Paris to improve his medical education, removing thence to Holland, where he gave botanical and anatomical lectures in Leyden, attracting many students. It was especially as an anatomist that he excelled. He wrote an anatomical work, and a fissure in the brain bears his name.

His contemporaries describe him as an extraordinarily handsome, imposing, witty man, who could laugh merrily on occasion, thus fulfilling his favorite motto of "*bene agere ac laeteri*." All the same, he was a man of exquisite manners. His jokes were never offensive; and, one of his biographers tells us, he was never seen intoxicated—which was not to be said of many men in seventeenth-century Holland. Nor was he a stickler for fees, being ready to do his best gratuitously on behalf of the poor who were members of the Protestant Walloon Church.

Van Helmont and Sylvius both thought in chemical terms, and both turned chemistry to account for the purposes of medicine. Yet how different were the two men. Van Helmont was a Catholic and a mystic; Sylvius was a Huguenot and a rationalist. Van Helmont lived a lonely life, was misunderstood, and ultimately prosecuted. Sylvius was a cheerful fellow, surrounded by thankful

patients and admiring students, and secured immediate success. Still, van Helmont's work has been more enduring; the problems he mooted are those which still exercise our minds today. Sylvius' mission has become no more than a memory of a distant past.

"Short-lived is the work of the happy man. He only who has eaten his bread with tears, knows the heavenly powers."

If we stop here to take stock, we shall see that three fundamentally important advances were made by scientific medicine during the early seventeenth century. The circulation became a proved fact, the phenomenon of generation was unravelled in large part, and the microscope was discovered. Two other important advances must also be noted as beginning during this century—the development of chemistry, and the birth of histology.

MEDICINE IN EUROPE IN THE EIGHTEENTH CENTURY

CHAPTER IX

WITH THE COMING OF DANIEL MASSINGILL TO THE COLONY OF VIRGINIA IN 1653 THE MAIN INTEREST IN THE MASSENGILL FAMILY IS TRANSFERRED FROM THE OLD WORLD TO THE NEW.

The division of medical history into centuries is a purely arbitrary and artificial classification that lends itself better than any other to the purposes of a general résumé. The Rational age in medicine begins where dogmatism leaves off; viz., about the close of the eighteenth century and the beginning of the nineteenth.

The field of medicine was wide and ill defined, cluttered, particularly in the eighteenth century, with an enormous variety of theories. Facts discovered in the seventeenth century frequently produced theories in the eighteenth. The eighteenth century is still spoken of as the "Period of Theories and Systems." There were so many theories, physicians did not know what to do. This confusion is apparent in MELCHIOR ADAM WEIKARD'S PHILOSOPHICAL PHYSICIAN which resulted in his ostracism. Weikard later admitted it was not tactful of him to have written the book, and he likened himself to the young girl who said, when she became pregnant, "But what doesn't one do when one is discontented."

On the threshold of the eighteenth century there was a remarkable change in the outlook of medical men. Everywhere there was great activity in study and experimenting. In the eighteenth century the minds of men were free to think as liberally as they wished on any subject as a result of the Reformation, and now modern medicine was beginning to take shape under the revival of the scientific spirit. Except in respect to smallpox, medicine had really made little practical progress in the treatment or prevention of diseases up to the beginning of the nineteenth century. Anatomy continued to advance and physiology, pathology and histology were developed intensively for the first time in medical history.

Some of the substances introduced into the practice of medicine during this period were glycerin, citric, gallic, melic, tartaric and hydrocyanic acids.

William Withering in 1785 gave the first accurate knowledge of Fox-glove. He began to collect plants for a young woman patient, and by the time he married her, he was a leading botanist; he confesses he received his hint about digitalis from an old woman's recipe, and the result was his pharmacological classic on the most valuable drug since the discovery of Peruvian bark. Digitalis, "the opium of the heart," was named by Fuchs, and was the most important addition to materia medica in the eighteenth century.

In the eighteenth century the fact that small doses of ergot caused the uterus to contract forcibly without poisoning the women to whom it was administered became known to some of the physicians of Europe.

Phlebotomy was a therapeutic sheet anchor which enjoyed wide popularity during this century. It was a very ancient method and its efficacy was as yet unquestioned by most physicians. There was hardly a disease for

which it was not used. John Coakley Lettsom, a young Quaker physician, is remembered by Lord Erskine's neat rhyme, prompted by the way in which he signed himself "I. Lettsom":

"Whenever patients come to I,
I physcis, bleeds, and sweats 'em.
If, after that, they choose to die,
What's that to me? I. Lettsom."

Johann Gottlieb Wolstein, a director of the Vienna Veterinary Institute, may be considered the founder of veterinary science in German-speaking countries. He published books in 1787 and 1791 and pointed out that fever by itself is not a disease, but nature's best weapon for the combat of disease. "Blood," he said, "is no water—it is the juice of life; a juice which after each venesection nature replaces rapidly, but in a raw, unprepared, watery, spiritless state." The bloodletters of the day did not listen to Wolstein, but kept on bleeding their patients white.

Joseph-Jacques de Gardane in 1774 was critical of the profession's treatment of diseases, especially venereal diseases: "There is nothing more surprising than the methods hitherto followed. In all the seasons of the year, all subjects presenting themselves, without regard to their sex or their age, and without any other preparation than that given to everybody, go through the same trials: all are bled, purged, bathed and rubbed. In such a case the application of the grand remedy becomes a business affair, a money matter. He who treats makes a bargain, pledging himself to cure the patient in the space of a short and often limited time, with the result that, when the time of treatment has expired, the patient is pronounced cured. It is in vain that the sequelae of the disease give evidence against the supposed success; one tries to persuade the patient that he is well, and reassuring him with further promises, discharges him: in such a manner the majority of those much vaunted cures are brought about.

"It is true that such conditions are demanded by the patient himself who negotiates for his health within a fixed time, but they are never fulfilled by those who do not blush to receive his money in advance. Hence arises that quackery so characteristic of those who treat venereal diseases. In the end, one always resorts to trickery, because one has promised more than one can do. But enough of those who in fear of losing their prey, snatch a fee from the hand of a patient in pain. A physician should promise nothing to his patient."

The eighteenth century is the period when Moliere, the French author, so caustically holds up to ridicule the pedantry and ineptitude of the French physician. The army surgeons in Prussia during this same century were ranked slightly above the drummers and beneath the chaplains, and were required to shave the officers upon request.

A story is told of a famous quack of the eighteenth century. His name was Rock, and he sold a cure-all remedy from an open-air booth near Saint Paul's Cathedral, London. He succeeded famously. One day an old friend of his chanced to pass, and after mutual greetings the two went to a nearby inn to pledge their friendship. The visitor made a statement of his surprise at the quack's success in these words: "Thee knowest thee never had no more

brains than a pumpkin." Instead of becoming indignant, the quack took him to the window and bade him count the passers-by. When twenty had passed, he asked his visitor, "How many wise men do you suppose were among that twenty?" "Mayhaps one," was the reply. "Well," returned the quack, "all the rest will come to me."

QUACKS AND NOSTRUMS

"From powerful causes spring the empiric's gains,
Man's love of life, his weakness, and his pains;
These first induce him the vile trash to try,
Then lend his name that other men may buy."

Crabbe:—The Borough.

There have always been quacks and always will be, but the eighteenth century was the "Golden Age" of picturesque and successful quacks, with high infantile and adult mortality, devastating epidemic diseases, the worst hospital management on record, brutal mishandling of the insane, the deaf, the dumb, the blind and the poor.

Medical ethics were less rigid in those days, and every one quacked it a little. There must have been some physicians among them who became discouraged and turned to quacks, who based their diagnosis on showy guesses or made none at all and gave treatment, useless treatment, with all the confidence of ignorance.

Rhazes, in the Middle Ages, had knowledge of the quacks: "The heart of the public is further turned from the capable physician and towards fools because the ignorant sometimes succeed in curing complaints where this has not been done by the most famous physicians. The causes are manifold, luck, opportunity, etc. Sometimes the qualified physician effects an improvement which is not, however, yet visible; the patient is then placed under another doctor who rapidly brings about a cure and obtains the entire credit.

"There are so many little arts used by mountebanks and pretenders to physic, that an entire treatise, had I a mind to write one, would not contain them; but their impudence and daring boldness is equal to the guilt and inward conviction they have of tormenting and putting persons to pain in their last hours, for no reason at all."

The culmination of quackery in the eighteenth century was due largely to the poor examples of royalty, male and female, who sat on the throne and patronized charlatans. Queen Anne, suffering from weak eyes, insulted the medical profession by transforming a mountebank into Sir William Read, principal oculist to her majesty. As an advertiser, Read was more aggressive than his predecessor John Case, who inscribed under the Sign of the Golden Ball:

Within this place
Lives Doctor Case.

The TATLER maintained that Case made more money by this couplet than Dryden by all his poetical works put together; Addison wrote also a note about Read:

"There is an epigram current, that Sir William could hardly read, but he

seldom suffered any periodical to make its appearance in public without some testimony under his own hand that he could hardly write. It appears he was a very comely person and a man of fashion, rich and ostentatious. . . . He kept an excellent table and was noted for his special brew of punch, which he served out to his guests in golden goblets."

It is probable that cosmetics were used then much more extensively among all classes than they are today. Even in bygone days there were ardent reformers in the field, for a bill introduced into the English Parliament in 1770 contains the following provisions: "All women of whatever age, rank, profession, or degree, whether virgins, maids, or widows, that shall, from and after such Art, impose upon, seduce, and betray into matrimony, any of His Majesty's subjects, by scents, paints, cosmetic washes, artificial teeth, fake hair, Spanish wool, iron stays, hoops, high heeled shoes, bolstered hips, shall incur the penalty of the law in force against witchcraft and like misdemeanors and that marriage, upon conviction, shall stand null and void."

✓ Joshua Ward, known as "Spot" because of a birthmark on his face, took up medicine when he failed in business as a dry-salter. He invented a "Pill" containing antimony, and by administering this remedy and at the same time practicing faith healing with the "laying on of hands," he developed a great reputation and became popular in the courts of King George II.

Franz Anton Mesmer, of Suabia, came to Vienna to study medicine. Numerous discoveries in electricity had been made and charlatans have a flair for exploiting scientific progress. Mesmer promulgated the theory that the sun and moon act upon living beings by means of the subtle fluids known as animal magnetism, analogous in its effect to the properties of the lodestone. He claimed that he could magnetize trees, so every leaf contributed healing to all who approached. Vienna knew him and did not believe him, and he went to Paris. He erected a temple to the god of health, and here thronged the afflicted.

"The patients sat around a magnetic baquet, and waited; the majority were women, and for them a special set of handsome young men had been provided. Each selected a woman and stared her in the eye; no word was spoken, but from somewhere softly sailed the music of an accordion, and the voice of a hidden opera-singer sweetened the incense-laden air. The young Apollos embraced the knees of the women, rubbed various spots, and gently massaged their breasts. The women closed their eyes, and felt the magnetism surge through them. At the critical moment, the master magnetizer, Mesmer himself, appeared on the scene. Clad in a lilac gown, with lofty mien and majestic tread, he advanced among his patients, making "passes" and accomplishing miracles. If a lady had a "crisis," Mesmer lifted her up and carried her to his private crisis-chamber. Nor were male visitors lacking at these seances, though as a rule they came not for Mesmer's medicine, but to observe the fainting girls, who often fell into convulsions. It must have been a pleasant form of hypnosis, for as soon as a patient recovered from one crisis, she begged for another."

Mesmerism became a sensation. It seemed as if all the world wished to be magnetized. The French government offered Mesmer a pension and the Cross of the Order of St. Michael for his secret; he refused, because he was already making a fortune.

Mesmer's disciple, Charles D'Eslon, a leading member of the Faculty and physician to Comte d'Artois, received a visit from a man in uniform: "In my capacity as lieutenant-general of police, I wish to know whether, when a woman is magnetized and passing through the crisis, it would not be easy to outrage her." D'Eslon answered in the affirmative, but explained that only the colleagues of Mesmer, physicians of probity, were entitled and privileged to produce a crisis.

Finally a commission was appointed to investigate the phenomenon; among the commissioners were some of the most illustrious scientists of the eighteenth century: the first name signed to the report is Benjamin Franklin, who was then located in Paris. They reached the verdict that magnetism is due to the imagination. They prepared also a secret report, "not adapted for general publication," which is more curious than the official version.

Benjamin Franklin, America's intellectual giant of the eighteenth century was one of the authors of the following extracts:

"It has been observed that women are like musical strings stretched in perfect unison; when one is moved, all the others are instantly affected. Thus the commissioners have repeatedly observed that when the crisis occurs in one woman, it occurs almost at once in others also. . . .

"Women are always magnetized by men; the established relations are doubtless those of a patient to the physician, but this physician is a man, and whatever the illness may be, it does not deprive us of our sex, it does not entirely withdraw us from the power of the other sex; illness may weaken impressions without destroying them. Moreover, most of the women who present themselves to be magnetized are not really ill; many come out of idleness, or for amusement; others, if not perfectly well, retain their freshness and their force, their senses are unimpaired and they have all the sensitiveness of youth; their charms are such as to affect the physician, and their health is such as to make them liable to be affected by him, so that the danger is reciprocal. . . .

"The magnetizer generally keeps the patient's knees enclosed within his own, and consequently the knees and all the lower parts of the body are in close contact. The hand is applied to the hypochondriac region, and sometimes to that of the ovary, so that the touch is exerted at once on many parts, and these the most sensitive parts of the body.

"The experimenter, after applying his left hand in this manner, passes his right hand behind the woman's body, and they incline towards each other so as to favor this twofold contact. This causes the closest proximity; the two faces almost touch, the breath is intermingled, all physical impressions are felt in common, and the reciprocal attraction of the sexes must consequently be excited in all its force. It is not surprising that the senses are inflamed. The action of the imagination at the same time produces a certain disorder throughout the machine; it obscures the judgment, distracts the attention; the women in question are unable to take account of their sensations, and are not aware of their condition. . . .

"The commissioners' experiments, showing that all these results are due to contact, to imagination and imitation."

Well-meaning but misguided legislative bodies have purchased remedies quite as illogical as the one bought by the state of New York:

Pursuant to the directions of an act, entitled, "An act for granting a compensation to John M. Crous, for discovering and publishing a cure for the canine madness, passed the second day of February, 1806."

For his remedy, Mr. Crous was rewarded by the State of New York with \$1,000, a considerable sum in 1806. And what was the valuable remedy of Mr. Crous? I fear the laudable desire of the New York Legislature to spare the citizens from a frightful disease was stronger than the medical discretion of that body; the prescription calls for a mixture made from the pulverized jaw-bone of a dog, the ground-up false tongue of a newly foaled colt, and the green rust scraped off the surface of an English penny of the reign of George I.

The Englishman, in the seventeenth century, who variously called himself Robert Tabor, Talbor and Talbot was shrewd enough to see the merits of Peruvian bark, advertised he possessed a secret remedy that triumphed over disease and kept death at bay. His successful treatment of Lady Mordaunt's daughter brought him to the chamber of Charles II, who "for good and acceptable services performed" appointed him royal physician, although he was not any sort of physician. Charles warned the College of Physicians not to interfere with Talbor's medical practice, and His Majesty further showed his gratitude by conferring knighthood upon him.

Sir Robert Talbor, under the name of Talbot, next appeared in France. "Nothing is talked of here but the Englishman and his cures . . . when his remedy is published, all physicians will be superfluous." Talbot's great opportunity came when the Dauphin was sick: "The English physician has promised the King, at the price of his head, to cure the Dauphin in four days. If he should fail, I really believe they will throw him out of the window, but if he succeeds I say a temple should be erected to him as to a second Aesculapius.

"D'Aquin, Louis XIV's chief physician, who is driven to his wit's end, at not being possessed of this panacea; and the rest of the tribe, who are overwhelmed with despair at the experience, the success, and the almost divine prognostications of this little foreigner. The King will have him make up his medicines in his presence, and trusts the management of the Prince wholly to him. The Dauphiness is already much better; and yesterday the Count de Grammont saluted D'Aquin with the following:

"D'Aquin can no longer withstand
Talbot, victorious over death;
The princess owns his healing hand,
Let each one sing with joyful breath, etc."

D'Aquin insisted the Dauphin had been bilious and never in serious danger; his words were drowned in the flood of praise that greeted "the Englishman's cure." Louis XIV deigned to request him to remain on French soil, as an ornament to the nation. As Talbor declined, the king purchased his formula with the understanding that it would not be divulged during the inventor's lifetime. Aside from an annual pension, Talbor received two thousand guineas, and the title of Chevalier. The world had not long to wait for the "Wonderful Secret for Cureing of Agues and Feavers," for upon the heels of his royal triumphs, Talbor died at the age of forty (1681). Talbor's method was immedi-

ately translated into English "for Publick Good." The formula consisted of rose leaves soaked in water with lemon juice, to which was added a strong dose of Peruvian bark (a synonym for Cinchona bark).

Talbor advertised that his secret remedy did not contain Cinchona, and he even went so far as to point out the dangers of using Cinchona bark in the treatment of malaria.

Here is the story of a widow who fooled a nation. She claimed to have a cure for stone in the bladder and became a celebrity. The following announcement appeared in the GENTLEMEN'S MAGAZINE, in 1738: "Mrs. Stephens has proposed to make her medicine publick on consideration of £5,000 to be raised by contribution." The church and peerage of England responded generously, yet the £5,000 could not be raised.

Joanna Stephens determined to keep her secret, but such was the public clamor that an Act of Parliament appointed a commission of investigation, which included the three leading surgeons of the metropolis: William Cheselden, of Chelsea Hospital, who could incise the bladder and remove the stone in fifty-four seconds; Sir Caesar Hawkins, of St. George's Hospital, inventor of the cutting gorget; and Samuel Sharp, of Guy's Hospital, whose treatise on surgical operations passed through ten editions and a French translation in his own lifetime. Their unanimous decision was as follows: "We have examined the said medicines and her method of preparing the same, and are convinced by experiment, of the utility, efficacy, and dissolving power thereof." Whereupon the British Government gave Mrs. Stephens the £5,000 and in return Mrs. Stephens published (June 19, 1738) a "full discovery" in the London Gazette. Her prescriptions were a decoction, containing boiled herbs and soap, with swine's-cresses burnt to blackness, "but this was only with a view to disguise it;" pills, consisting of wild carrot and burdock seeds, hips and hawes, reduced to ashes with alicant soap and honey; powder, composed of roasted egg-shells crushed with garden-snails in the month of May.

The "Act for providing a Reward to Joanna Stephens," bore not only the names of the surgeons, but the greater name of Stephen Hales, England's chief physiologist since Harvey. The prime minister, Sir Robert Walpole, swallowed the saponified snails by the pound. After his death, Sir Caesar Hawkins performed the autopsy, and discovered several stones in his bladder. It is calculated that in the last few years of his life an otherwise intelligent Prime Minister had consumed 180 lbs. of soap and not less than 1,200 gallons of lime-water.

Aetius was a Greek of the fifth century, who was an authority on plasters, and who was said to have first made use of the magnet in medicine. He was the first physician-pharmacist to embrace Christianity. In the works of Aetius, reference is made to several celebrated nostrums, one of which, a collyrium, sold for the equivalent of \$500, and was scarce at that price; another was modestly named "isotheos" (equal to God).

During Sir Walter Raleigh's twelve years' imprisonment in the Tower in the earlier part of the reign of James I, he was allowed a room in which he fitted up a laboratory, and divided his time between chemical experiments and literary labors. It was believed that Raleigh had brought with him from Guiana some wonderful curative balsam, and this opinion, combined with the

knowledge that he dabbled largely with retorts and alembics in the Tower, ensured a lively public interest in his "Great Cordial" when it was available.

The composition of the "Great Cordial" was given September 20, 1662:

"The cordial then consisted of forty roots, seeds, herbs, etc., macerated in spirit of wine, and distilled. With the distillate were combined bezoar stones, pearls, coral, deer's horn, amber, musk, antimony, various earths, sugar, and much besides. Vipers' flesh, with the heart and liver, and 'mineral unicorn' were added later on the suggestion of Sir Kenelm Digby."

Quacks abounded in London at this time. The three greatest, and perhaps the last of the great quacks, were a German, an Italian Jew, and a Scot—Myersbach, Count Alessandro Di Cagliostro (the Quack of Quacks), and James Graham.

Myersbach was an M. D. of Erfurth in Germany. The degree was not hard to get at that time. A young man traveling in Germany had no difficulty in obtaining it for one Anglicus Ponto. After paying the necessary fees and receiving the degree, he revealed the fact that Ponto was his favorite mastiff.

Myersbach's specialty was urinoscopy or water-casting. In the Middle Ages the urinal was the emblem of medical practice, and was even used as a convenient sign-board device. Ancient water-casters claimed no difficulty in forecasting the sex of an unborn child from the prospective mother's urine.

Myersbach reached London about 1774, and proceeded to accumulate a fortune. After two years of immunity from all criticism, he was attacked by John Coakley Lettsom, one of the founders of the Medical Society of London. Lettsom and his friends got a great deal of amusement out of Myersbach. They submitted a flask of port wine to him, and were assured that the case from which it came was one of serious disease of the womb. From the urine of a gelding the omniscient doctor deduced that the patient was a lady, and that she had a disorder of the womb, two children, and a bad temper. A cow's urine distressed him greatly. He explained that it obviously came from a young man who had been much too free with the ladies of the town.

Dr. Lettsom made the following public statement in regard to Myersbach:

"Dr. Myersbach knew less of urine than a chambermaid and as little of medicine as most of his patients." Myersbach discreetly packed up his bags and retired to the Continent for some twelve months. Then he returned and had as great a success as ever.

✓ Cagliostro, the Quack of Quacks, started life as Joseph Balsamo and graduated early as a sneak-thief and forger. He came to London in 1771 with his wife Lorenzo because there was more scope for his natural genius in capital cities, and also because he was wanted by the authorities, for forgery and kindred activities in many other places. Soon the London police were seeking him as earnestly as their colleagues in Italy, Spain, and Portugal, but by that time Joseph was in Paris, as the Marquis de Balsamo, rejuvenating the aged, healing the sick, softening marble, making gold, transforming cotton into silk, and generally benefiting mankind at large.

He traveled extensively, modestly confining his activities to making beautiful the very ugly, and causing diamonds and pearls to grow to twice their original size. He returned to London, but this time as Captain, later Colonel, and soon afterward Count, Cagliostro. Unfortunately he was found out while

indulging in his favorite relaxation of swindling the very wealthy, and languished for a while in an English prison. On being released he must have resolved to turn over a new leaf. He was soon established in popularity as a nobleman, an illustrious scientist, and a great philanthropist.

He started traveling again in a magnificent private carriage, surrounded by couriers, lackeys, and valets. His claims were as modest as ever. He could, for a considerable consideration, raise the dead, restore lost youth, foretell the future, and perform miracles. In Russia, Poland, and Germany he was received with acclamation and showered with presents. He would never take fees for healing the sick—and never refuse presents. Wherever he went the troops had to be called out to control the crowds. He was an honored guest of every other princely family in Europe.

He returned to Paris in 1785, to be promoted immediately to the pedestal from which Mesmer had just toppled. Cagliostro and his wife were mixed up—for perhaps the first time in their career innocently—in the affair of Marie Antoinette's diamond necklace. They were sent to the Bastille, but acquitted after trial. Their release provoked great popular demonstrations in their favor, but the King ordered them both to leave Paris within a week. The one crime of which he was not guilty ruined Cagliostro. London would have none of him. Switzerland drove him from its frontiers, and he returned at last to Rome. There was no market even there for his love-philtres and elixirs. He took up again Freemasonry, in which he had long dabbled, and this soon brought him into the hands of the Inquisition. Five years later he died in prison.

James Graham, born in 1745, the third of this trio, was the son of an Edinburgh saddler. He studied medicine there for a short time, but it is doubtful if he ever took a degree or obtained a qualification of any kind. After practicing for a short time at Pontefract, he went to America as a sort of itinerant specialist in diseases of the eye and ear. There he became acquainted with Benjamin Franklin's discoveries and quickly saw the possibilities of using electricity for the exploitation of the public. He returned to England, and after practicing for a while in the neighborhood of Bath and Bristol he established what might be termed an electro-therapeutic practice in London. This first venture was not very successful, and so he returned to Bath, and soon had great numbers of patients waiting to spend a few minutes sitting on his "magnetic throne" or lying in an "electrical bath."

Graham knew how to keep his followers interested, whether lecturing on the "Preservation and Exaltation of Loveliness," or publishing a pamphlet on sex, "as delivered by Hebe Vestina at the Temple of Hymen." He vended a remedy, so rare and valuable, that he demanded for this Elixir of Life the payment of £1,000 in advance; whoever took it would reach 150 years at the minimum, and in fact would live as long as the medicine was renewed, a process which could go on indefinitely.

Graham later went to Paris and treated many aristocratic patients. He built a Temple, the door of which was always open, so that the poor might enter as freely as the rich. All that was demanded of the poor was a fee of £6, which was paid to one of two regally dressed porters. Once this trifling formality was over, rich and poor males were alike conducted to the Great Apollo Apartment. Soft music always preceded his discourse, and at appro-

priate moments his audience received mild electrical shocks from the carefully wired chairs in which they were seated. As a grand finale an enormous spectre came up through the floor and handed to Graham bottles of his famous "aetherial balsam," which was guaranteed to promote fertility.

The Goddess of Health who officiated at the ceremonies was the bewitching shawl-dancer, Emma Lyon, who was familiar with many beds, later famous as Lady Hamilton and as the enchantress of Lord Nelson.

If, despite the guarantee, the aetherial balsam did not promote a successful conception and lead to the production of the loveliest possible children, Graham placed at the disposal of his clients his wonder of wonders, the innermost mystery of the Temple of Health. This was his Celestial Bed, which assured conception to the occupants.

To quote from an article written at the time and reprinted in the *British Medical Journal* for 1911: "A sumptuous bed in brocaded damask supported by four crystal pillars of spiral shape festooned with garlands of flowers in gilded metal is its essential feature; and for a fee of fifty guineas Dr. Graham offers couples, old and young, the means of getting offspring. On whatever side one gets into this bed, which is called 'Celestial,' one hears an organ played in unison with three others, which make agreeable music consisting of varied airs which carry the happy couple into the arms of Morpheus. For nearly an hour that the concert lasts one sees in the bed streams of light which play especially over the pillows. When the time for getting up has come, the magician comes to feel the pulse of the faithful, gives them breakfast, and sends them away full of hope, not forgetting to recommend them to send him other clients."

Other claims made for the Celestial Bed: If the young lay in this bed, they would retain their good looks; if the old experienced its effects, they would be rejuvenated; if married or unmarried slept in it, their progeny would be healthy, beautiful, and virtuous. The price for a night in this bed was from £50 to £100.

This vogue lasted for three most profitable years, at the end of which time Graham returned to his native Edinburgh, there to preach the virtues of the mud bath and a fasting cure. In his declining years he became first religious and later maniacal. He died suddenly in 1794. Graham's cure was to assure life for a century, but he died before he was fifty.

Hermann Boerhaave (1668-1738), was one of the most celebrated physicians of the eighteenth century. He was born in the village of Voorhout, near Leyden, on December 31, 1668. In 1693, he took the degree of Doctor of Medicine. He occupied most of the chairs in the University of Leyden and was known as the Batavian Hippocrates. His practice was a form of eclecticism, claiming to accept what was good in all the theories of the time.

Boerhaave made no discoveries; he did not contribute any new ideas of moment to medicine. Nor did he belong to any school. Yet that was what gave him his strength. He adopted what seemed to him good, no matter the source. The secret of his successes is to be found, not so much in his scientific writings, as in his personality, in his alluring personality as physician and clinical teacher. He was generous and devoid of professional envy.

In spite of his mildness and kindness, Boerhaave could assert himself. Knowing the history of medicine, he felt impelled to say, "Galen has done more harm than good." In a similar strain, Boerhaave declared: "If we compare the good which a half dozen true sons of Aesculapius have accomplished since the origin of medical art upon the earth, with the evil which the immense mass of doctors of this profession among the human race have done; there can be no doubt that it would have been far better if there had never been any physicians in the world."

This reflection did not cost Boerhaave his general popularity, since all physicians believed they were among the six exempted Asclepiads.

In 1725 he suffered from severe inflammation of the joints, which deprived him completely of sleep. These attacks of gout became so violent and so frequent that Boerhaave had to cut down his work, and in 1729 he resigned the professorships of chemistry and botany. He continued, however, to give clinical instruction until in 1738, in the seventieth year of his life, when he was finally relieved of his sufferings.

Albrecht von Haller (1708-1777), a scion of an old Swiss family at Berne, was Boerhaave's greatest pupil. He was an infant prodigy, explaining the Bible at four, outlining a Chaldee grammar, compiling two thousand biographical sketches, preparing a Greek and Hebrew vocabulary, and writing a Latin satire on his tutor, before his tenth birthday. His contemporaries regarded him as a man of universal learning, as one who was interested in every domain of human knowledge.

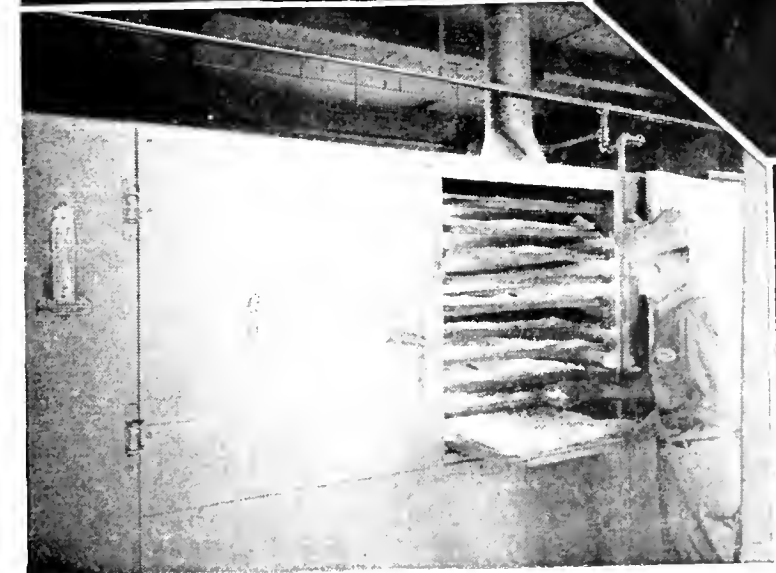
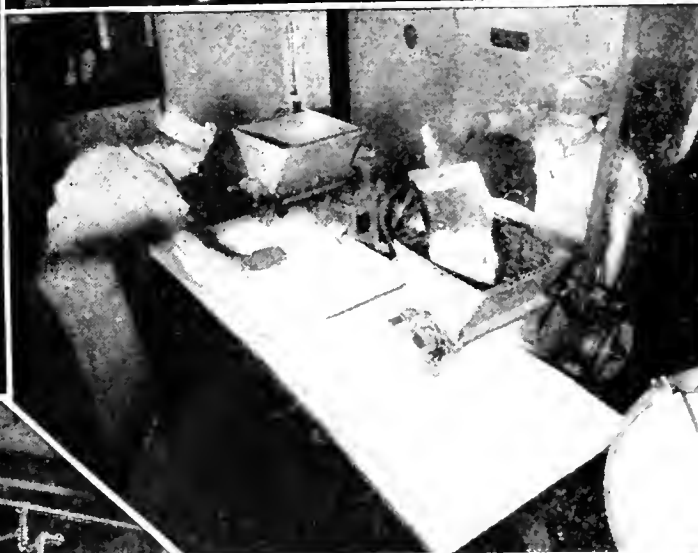
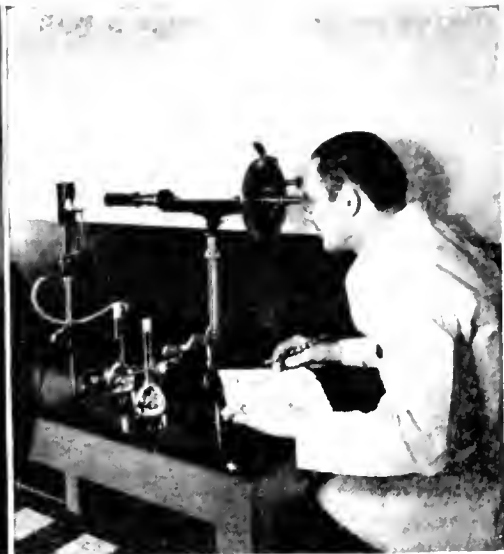
He wrote poems and novels that were read at the time. He had nothing in common with the vigorous young associates of his own age, till he became a student at Tübingen. The merry life of the students, the influence of frivolous comrades, and association with the pretty ladies of Tübingen "who were by no means coy," continued to break down the barriers between young Haller and the life of the everyday world.

Tübingen, however, was not a place for serious studies, so in the spring of 1725 Haller removed to Leyden. There he found all that his heart could desire: a dissecting-room in which there were human bodies; a botanical garden; a clinic. Above all in Albinus and Boerhaave he found teachers who were to exert a decisive influence upon his career.

Haller's versatile genius revealed itself best in physiology. Before his time there had never existed a complete treatise on physiology. From 1759 to 1766 he published his great work *ELEMENTA PHYSIOLOGIAE CORPORIS HUMANI*, in eight quarto volumes, thus establishing modern physiology and earning for himself the lasting title of father of physiology.

In 1759, a student of twenty-six, a Berlin tailor's son working for his doctorate, attacked the preformation doctrine in his thesis, *THEORIA GENERATIONIS*, which he dedicated to Haller, whom he called "glorious man." Haller was polite, but remained convinced. Between Haller, potentate of physiology, and this unknown Caspar Wolff, there could be no argument. Haller simply laughed, and no one read the young doctor's thesis. Caspar Wolff is now "justly reckoned the founder of modern embryology."

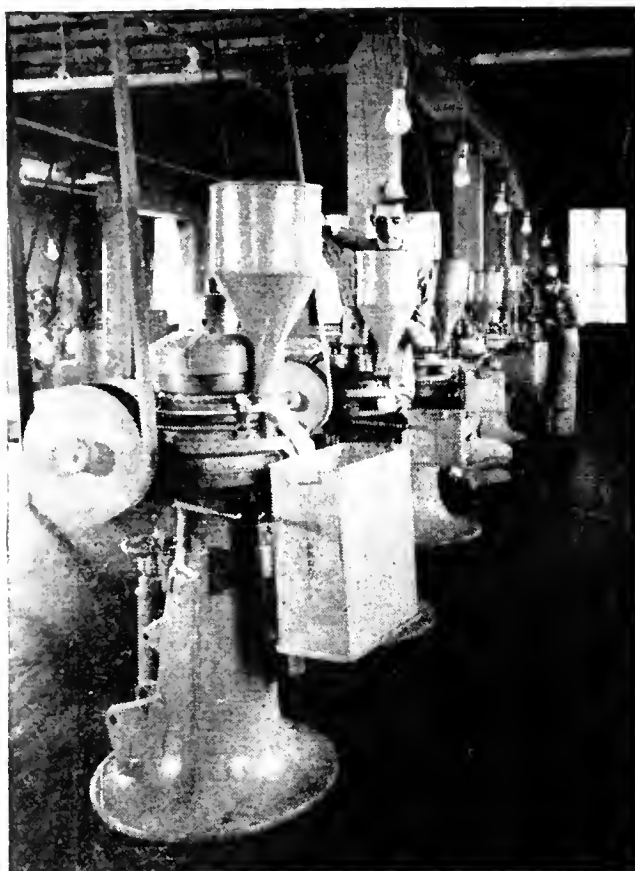
As one contemplates the wonders of eighteenth century medicine, he barely



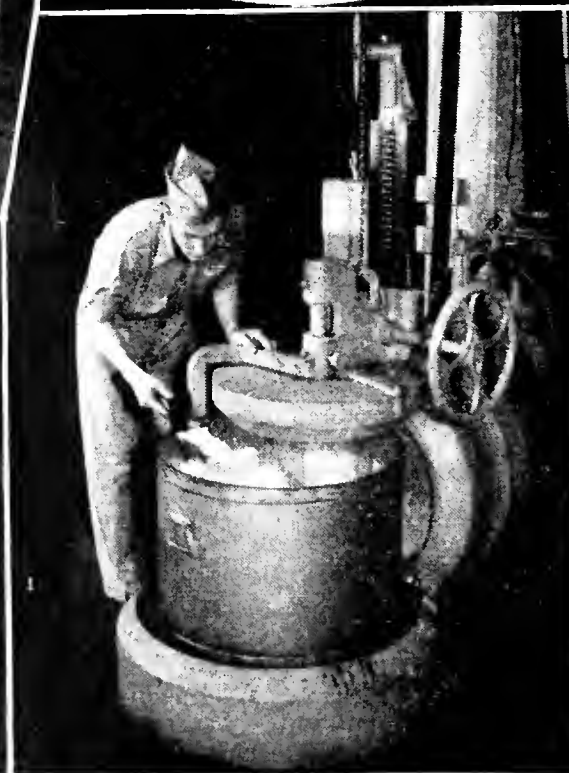
Actual scenes which show
the manufacture of pharmaceutical products in the
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laboratories.







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laboratories.



emerges from the captivating influence of Haller, before encountering the striking genius of Bichat, also the founder of a new branch of medical science—Francois Xavier Bichat, (1771-1802), a Frenchman, the son of a French physician. Bichat is regarded as the founder of modern histology.

Gerhard van Swieten (1700-1772) was one of Boerhaave's pupils, and perhaps the favorite of them all. Van Swieten certainly had merits as a medical man: when he was called over from Holland, the Austrian throne had no heir; van Swieten drew the husband aside, and gave him some private instruction, with the result that Maria Theresa became pregnant sixteen times. He was now forty-five years of age. Had it not been for Maria Theresa's summons he would probably have remained for the rest of his life a general practitioner in a small Dutch town. History would have taken little notice of him, regarding him as no more than one among the very large number of Boerhaave's pupils.

For years Boerhaave and van Swieten had lived and worked side by side in the friendliest way, closely linked though there was so much difference between their ages. Van Swieten practiced in Leyden, and was a very successful lecturer at the university.

Anton de Haen (1704-1776) was the successor of van Swieten at the Old Vienna School. He was a clinician of ability who left eighteen volumes behind him, and in these treatises we find his defense of witchcraft. This incongruity later struck Virchow, who in his survey of a century of pathology, exclaimed: "With the fanaticism of a monk, de Haen defends magic and miracles, and attacks the philosophers as atheists. He prepared the soil in which soon were to sprout animal magnetism and somnambulism. What contrasts in one man! The same physician who introduced the thermometer into the observation of the sick, and dissection into clinical investigation, believes in witchcraft and persecutes witches."

It was only to be expected that two such strong personalities as van Swieten and de Haen should found a school. Van Swieten died in 1772; de Haen in 1776; and Haller in 1777. Thus the great generation of the disciples of Boerhaave came to an end, but their work lived after them. An admirable new university had come into being at Gottingen.

Pathological anatomy also was established in the eighteenth century by Giovanni Battista Morgagni (1682-1771). The founder of histology, Bichat, was a Frenchman, whose work was ended by death in his thirty-second year; the founder of pathology, Morgagni, was an Italian who compiled his great work when he was within hailing distance of eighty. He was in his ninetieth year when he died.

Lazzaro Spallanzani was the indolent kinsman of Laura Bassi, professor of experimental physics at the University of Bologna. He was fifteen before he finished his grammar school course.

Spallanzani is one of the great names in physiology. His early idleness was replaced by an incessant and effective activity. In his experiments on digestion, he swallowed linen bags containing food, perforated wooden tubes, and was enough of a scientific martyr to obtain gastric juice by making himself vomit on an empty stomach. He supplemented his self-experimentation by experiments on a surprising variety of animals.

Spallanzani found the fertilizing power of the spermatic fluid is lost when it is filtered, though he left the correct interpretation for later workers; by putting male frogs into trousers during cohabitation, he noted the ova remained unfertilized; he found that fertilization does not occur unless there is contact between sperm and egg. He was the first who artificially fecundated the eggs of frog and toad, and the first who impregnated a bitch by injecting warm semen into the vagina.

The country practitioner, Thomas Fuller of Sevenoaks in Kent, gave a clear conception of specificness in infection and immunity of eruptive fevers in anticipation of the modern doctrine: "Many varieties are to be met with in books, of other diseases mixed in with the smallpox, but nobody ever yet saw a miliary fever, or measles, or any of its sub-species beget a true smallpox, or any of its sorts; nor on the contrary; and nobody was ever defended from the infection of any one sort by having had another sort. To every seed its own body; and therefore the pestilence can never breed the smallpox, nor the smallpox the measles, nor they the crystals of chicken pox, any more than a hen can a duck, a wolf a sheep, or a thistle figs; and consequently one sort cannot be a preservative against any other sort."

Stephen Hales was a physician and a parson. In 1733 he wrote a book on the force of blood in animals. A century after Harvey's demonstration of the circulation, Hales discovered how to investigate its dynamics. When Hales fastened glass-tubes into the arteries and veins of horses, he devised a crude pressure-gauge which in his hands gave remarkable results. Thus to the old story of the pulse, Stephen Hales added the new chapter of blood-pressure. This busy clergyman stands among the pioneers of experimental physiology, and as the Father of Blood Pressure he initiated a method which is now of primary importance in the diagnosis and treatment of disease.

James Currie, a Scotsman, spent several years in America, where he had been informed it was easy to acquire a fortune. Ill-luck in business and the Declaration of Independence drove him home, where he graduated in medicine, and in his spare time introduced cold douche-baths of sea-water in typhoid, including verification and tabulation of results with the clinical thermometer.

Valvular disease of the heart ended a career of constant misfortune and glory; and he sleeps beneath the appropriate epitaph:

"Art taught by thee shall o'er the burning frame
The healing freshness pour and bless thy name."

Thomas Robert Malthus, a clergyman, argued that "the realization of a happy society will always be hindered by the miseries consequent on the tendency of population to increase faster than the means of subsistence," and thus became the father of the birth-control movement and began a controversy which is still mooted.

Praise and obloquy were showered upon the author in profusion. Unswayed by the adulation, and untouched by the abuse, he quietly kept on revising successive editions of his epoch-making book. According to Malthus, only when time had cooled the passions and partial impotence supervened, should man and woman repair to the altar. He looked upon the lusty bridegroom and

the blushing young bride as a menace to society—his ideal was the decorous middle-aged couple content with Platonic relations.

William Cullen, an Edinburgh professor, made many comments upon the use of drugs which are worth reading even today, for the spirit of criticism is modern. He suggested that the use of certain drugs be restricted and the use of others abandoned. Cullen's century witnessed the origin of American medicine, and before this country wrote its own manuals of *materia medica*, his works were gospel.

John Brown (1735-1788), a Scot, founded the "Brunonian system." Brown was a very remarkable man, at once a genius and a rogue. He entered the medical profession after having been a minister of religion and then a schoolmaster. A heavy drinker, he became deeply burdend with debt, and thereby found his way into prison. Nevertheless his *ELEMENTA MEDICINAE*, published in 1780, created much interest. He set out from the doctrines of Cullen, in whose house he had lived for a short time as private tutor. He differed in various respects from his patron. According to Brown's teaching, the decisive factor in bringing about disease was not excess or defect of nervous energy, but the stimulus, the exciting factor, which set nervous energy in motion.

William Heberden of London first described angina pectoris, and the fingers in arthritis deformans still known as Heberden's nodules.

England in particular was the country where clinical medicine seemed to thrive most actively during this period. The two Hunter brothers, William (1718-1783) and John (1728-1793), have become fixtures in medical history.

William Hunter, the elder of the brothers, settled in London in 1740. He had studied medicine in Glasgow, was a successful surgeon, was devoted to anatomy, and was the pride of the family.

John Hunter was born at Long-Calderwood, in the county of Lanark, on February 14, 1728. In childhood he was the despair of the elders of his household, and no one ever anticipated for him a great career. At school he was an unsatisfactory pupil, so that his schooldays were short. Capricious and ill-tempered, when he could not get his own way he would howl for hours in succession. The only things he really liked doing were playing practical jokes or wandering in the woods in search of birds' eggs.

What was to become of him? Perhaps William would help him, could find a use for him. John wrote to London, and William agreed to give his young brother a trial. Wonder of wonders, the ne'er-do-well proved his mettle as William's assistant! He worked all day and far on into the night, kept the dissecting-room in good order, and showed himself an adept at securing the requisite bodies. Soon, moreover, he became a skilled dissector.

On William's recommendation, John Hunter entered as surgeon-apprentice at Chelsea Hospital, and after a few years he had mastered the craft. William wanted John to make up for the defects of his general education, so he sent the young man to Oxford, but John stayed only a few months, saying when he returned: "They wanted to make an old woman of me, or that I should stuff Latin at the University; but these schemes I cracked like so many vermin as they came before me."

For a time he became an army surgeon, and then a naval surgeon. Eng-

land was at war with France and Spain. Hunter was present at several engagements, and acquired a great deal of experience. When the army was disbanded Hunter returned to London and settled down as a surgeon.

Hunter was perpetually on the look-out for rare beasts. If a gypsy passed by with a dancing bear, Hunter would make a bargain with the man to bring the creature for dissection when it died. The Irish giant cost him much labor and a great deal of money. He was absolutely determined to have O'Bryan's skeleton for his collection. When the giant fell sick, Hunter had him kept under observation. But the Irishman scented danger, and, regarding with horror the thought that his body would be cut up, he made his friends promise that when he died they would never lose sight of his corpse until it had been sealed up in a leaden coffin and sunk in the sea. We are told that bribery and corruption to the tune of £500 were needed before Hunter could get his way. The upshot was that the skeleton is in the Royal College of Surgeons' museum, and that O'Bryan's name has become immortal.

In Hunter's time, physicians were still discussing whether syphilis and gonorrhea were two manifestations of the same disease, or different diseases. To settle the problem, John Hunter, on a Friday in May, 1767, inoculated himself on the prepuce and glans with gonorrheal pus; unknown to him, the subject from whom he took the poison had also a hidden chancre within his urethra, and Hunter contracted not only gonorrhea but syphilis. He was now convinced that "matter from a gonorrhea will produce chancres," and there is but a single venereal virus. It is one of the tragedies of science—the master of the experimental method being led hopelessly astray by an heroic experiment.

In the eighteenth century, medicine and surgery were two distinct provinces. John Hunter was one of the most successful surgeons of his time. Along this path he was a pioneer hastening greatly in advance of his time, and he constructed the first bridge between surgery and medicine.

Carl von Linné, whose name is better known in the Latinized form of Linnaeus, was a Swedish botanist and was probably the greatest one who ever lived. He served as a link between European and American medicine.

Linnaeus, who completed his medical studies in order to wed the daughter of a practitioner who would accept only a physician as a son-in-law, wrote a work on *materia medica*.

MEDICINE IN AMERICA IN THE SEVENTEENTH AND EIGHTEENTH CENTURIES

CHAPTER X

IN AMERICA, BY THE MIDDLE OF THE EIGHTEENTH CENTURY, THE MASSENGILL FAMILY PIONEERED FROM VIRGINIA INTO NORTH CAROLINA AND LATER FARTHER WESTWARD. HENRY MASSENGILL IN 1769 WAS THE SECOND PERMANENT WHITE SETTLER IN WHAT IS NOW TENNESSEE. LATER, IN THE WILDERNESS WEST OF THE ALLEGHANY MOUNTAINS, HE AND HIS NEIGHBORS FORMED THE WATAUGA ASSOCIATION, WHICH ADOPTED THE FIRST WRITTEN CONSTITUTION FOR THE GOVERNMENT OF AMERICAN-BORN FREEMEN.

Medicine in America during the seventeenth and eighteenth centuries is not greatly different from medicine in Europe at the same period. Clinical medicine was evolved in the eighteenth century, after attention had been given to the importance of pathology and post-mortem examinations of diseases, and this work led to better diagnostic practices.

Physicians in the new world, as a rule, either compounded their own prescriptions or else employed apothecaries as assistants. They imported such European drugs and preparations as they needed and used the indigenous drugs whose properties they learned from the Indians.

MEDICINE IN VIRGINIA

The first doctors to practice in Virginia were picked and sent over by the London Company. They were English physicians transferred to Virginia soil. Their medical education was obtained like that of other English physicians of that day. To understand properly the seventeenth century practice of medicine in Virginia one must visualize the doctor and chirurgon practicing side by side, often confused with one another, with no clearly defined differentiation unless it were one of education. There were no obstetricians, only midwives; no dentists, except perhaps an occasional traveling one, the emergency dentistry being in the hands of the physicians.

Henry Kenton, was the first English physician to land upon the American continent (1603) and the first to lose his life in line of duty.

When the colonists in 1607 landed at Jamestown among their number were two "chirurgeons." At that time there was no very sharp distinction between surgery and barbering. One of the chirurgeons was Will Wilkinson. He was classed with "Will Garret the Bricklayer" and "Tho: Cowper the Barber" and was manifestly not a "gentleman." The inclusion of a barber in the personnel of the adventurers at a time when there was no very sharp distinction between surgery and barbering leads us to believe that the early Virginia chirurgeons were relieved of this distasteful sideline of their profession. The term "barber-surgeon" does not appear in the Virginia records, and it is to be inferred that the cleft between the two professions, which had occurred in England, was real and permanent in the colony. The gentleman chirurgon was Thomas Wotton.

The following year, 1608, 120 additional settlers reached the colony and with this supply came Dr. Walter Russell, physician, Post Ginnat, chirurgion, and two apothecaries, Thomas Field and John Harford. Walter Russell was the first physician, as distinguished from the chirurgion, to come to this country.

When Lord Delaware came to Virginia in 1610, he brought with him a physician, Lawrence Bohun, "Doctor in phisick." He is the second physician mentioned in the colonial records as coming to Virginia, and is said to have been "a long time brought up amongst the most learned Surgeons and phisitions in the Netherlands." Sickness and a dwindling medical supply stimulated "Mr. Dr. Bone (Bohun)" to investigate the medical properties of native plants. He experimented with Sassafras, galbanum, mechoacon, or rubarbum album, "in cold and moist bodies, for the purginge of Fleame and superfluous matter."

In 1621 Dr. Bohun was succeeded by Dr. Pottes, a Master of Arts and as he affirmed "well practiced in Chirurgerie and Phisique, and expert also in distilling of waters."

In August the Council in England wrote Governor Yeardly in Virginia that "they had sent . . . Dr. John Potts for the phisition's place with two chirurgions and a chest of Physicke and Chirurgery."

During Dr. Pott's first year, news reached England that the colonists, after making a treaty of peace with the Indians, had poisoned a great many of them, and that Dr. Potts was said to be "the chief actor in it." He was much blamed in England and lost the position he had held in the Council. The Earl of Warwick objected to his appointment, because he was "the poysoner of the salvages thear."

A glimpse of the convivial disposition into which Pott appears to have retreated on occasion is given in a letter from George Sandys at Jamestown to a friend in London: "I have given from time to time the best councell I am able, at the first, he (Dr. Pott) kept companie too much with inferiours, who hung upon him while his good liquor lasted. After, he consorted with Captaine Whitacres, a man of no good example."

In 1625 a petty quarrel brought the Doctor into court. "At a Court, May 9, 1625: Mrs. Elizabeth Hamer sworne and examined sayeth, yt (that) Mrs. Blany did miscary with a Childe, ut sayeth she doth not know whether Mrs. Blaynie did request a peece of hog flesh of Mr. Doctor Pott or nott, or that the wante of the peece of flesh was the occasione of her miscarynge with Childe, but sayeth yt Mrs. Blany did tell this Emamt (Examinent) yt she sent to Doctor Pott for A peece, and was denied."

Pott came to the colony with excellent professional recommendations. His greatest enemy, Governor Harvey, wrote that he was "skilled in the epidemical diseases" of the planters. The court records contain frequent references to his fees for medical attendance. In 1625 John Jefferson is ordered to pay Dr. Pott "for Curynge of henry boothe's Eye." The next year we find Stephen Tailor "being sicke an brought home to Dr. Pott's his house." The hospitalization of patients in the homes of physicians runs through the whole century.

Dr. Pott was the first to locate land at the present site of Williamsburg. His place there was called Harrop after the family estate in Cheshire, England.

Edward Gibson was apparently a physician, for in 1622, just before the massacre, he made a professional trip to Falling Creek: "Capt. Nicholas Martin sworne and examined saith that Ed: Gibson camm upp to the fallinge Creeke, administered Phisick to ev'y of the p'sons specified, then went & did that Cure uppon Fossett who was farre spent with the droppsie and not one of these his patients misc(arried)."

"SEASONING"

The immigrant who survived his passage from England had to face what was known in Virginia as the "seasoning." This usually came in the summer and was attributed to many causes. According to DeVries, during "June, July and August people that have lately arrived from England die like cats and dogs, whence they call is the sickly season." Immigrants soon learned that to avoid the "summer sickness," as the seasoning was sometimes called, it was best to reach Virginia in the fall and winter.

Beverly explains the "fluxes, fevers and the bellyache" that greeted newcomers by the fact that they "greedily surfeit with their delicious fruits, and are guilty of great intemperance therein, through the exceeding plenty thereof, and liberty given by the inhabitants; by which means they fall sick, and then unjustly complain of the unhealthiness of the country."

April, 1688: "A fast for ye great mortality (the first time the Winter distemper was soe very fatal . . . the people dyed, 1688, as in a plague—bleeding the remedy, Ld Howard had 80 ounces taken from him)."

Smallpox, unknown in America until after the advent of the Spaniards, was first recorded in the West Indies in 1507. The first recorded epidemic of smallpox in the colony occurred in 1667. In that year a sailor with smallpox landed at Accomack. He was isolated by the surgeons but escaped to a nearby Indian town and infected two tribes. The disease spread all over the Eastern Shore with fearful mortality.

Lord Delaware, who was himself a catalogue of seventeenth century diseases, complained that among other ailments "the Flux surprised me, and kept me many daies; then the cramp assaulted my weak body, with strong paines . . . & afterwards the Gout . . . afflicted me . . ."

Most of the Virginians referred to in the colonial records as "doctor" probably had no academic right to such a title. Yet a few undoubtedly did hold degrees in medicine.

Many physicians were at one time indentured servants. Patrick Napier and Francis Haddon are known to have come to Virginia under terms of indenture, paying their passage money by a period of servitude. John Williams was a Dutchman and a surgeon who was punished in 1640 for an attempted runaway while serving an indenture. John Inman is another example.

The more common type of indenture was the apprenticeship of a young man to an established physician to learn his profession. As there were no medical schools in America until 1776, this was the usual method of becoming a doctor.

In the eighteenth century we find William Byrd II writing to Sir Hans Sloane: "Here be some men indeed that are call'd Doctors: but they are generally discarded Surgeons of Ships, that know nothing above very common

Remedys. They are not acquainted enough with Plants, or other parts of Natural History, to do any Service to the World, which makes me wish that we had some missionary Philosopher, that might instruct us in the many usefull things which we now possess to no purpose."

The following are some of the remedies used in Virginia in the seventeenth and eighteenth centuries: "Rock alum, plain alum, a kind of clay called wapeib which the inhabitants used "for the cure of sores and woundes," sassafras, which he considers better than guaiacum, and sweet gums and tobacco."

"The French relations of their Voyages to Canada, tell us that the Indians and themselves falling into a contagious disease, of which Phisitions could give no Reason or Remedy, they were all in a short space restored to their health meerly by drinking water, in which Saxifrage was infused and boyled." Sassafras was said to be useful in skin diseases, gout, rheumatism and syphilis. At one time it was commonly sold at daybreak in London under the name of Saloop, and until fairly recently saloop venders were found there.

Snake root (serpentaria) was said to have a tonic, diuretic, diaphoretic and stimulant effect and was popular in typhoid and digestive disorders. Black snake root (radex serpentaria nigra) was a remedy for gout, rheumatism and amenorrhea.

"The Jamestown weed, called *datura stramonium*, is at first sedative and antispasmodic, in larger doses a narcotic and poisonous."

Beverly extolled the wild cherry bark as a substitute for cortex peruviana and the powdered bark of the prickly ash as a specific in "old wounds and long running sores."

Ipecac, a medicine much prized by Colonel Byrd in the next century, was a secret remedy for dysentery until 1688, when the French Government paid 20,000 francs for it.

In December, 1620, Captain George Thorpe wrote to England that he was "persuaded that more do die here of the disease of their minds than of their body . . . and by not knowing they shall (have to) drink water here."

Every age has its fashions. In medicine that of the seventeenth century was the clyster. The clyster, an enema for opening the bowels, was administered not by the gravity method but by a large and formidable syringe. The new fashion was widely advocated and obtained an extraordinary vogue.

The ibis is said by Pliny to have demonstrated its use to the Egyptians: "By means of its hooked beak it laves the body through that part."

In colonial Virginia, clysters, or "glysters," probably enjoyed the same popularity. There are many references to them in the itemized accounts of doctors, preserved in the county court records. The clyster was apparently administered by the physician, and the fee was thirty pounds of tobacco.

Phlebotomy was very popular at this period. There was always, however, some stigma connected with it. In the Middle Ages medicine was largely in the hands of the clergy, who regarded blood-letting, surgery and dissection as phases of medicine to be farmed out to the more menial barbers and barber-surgeons. Bloodletting was, therefore, more particularly the function of the surgeon or barber. It will be recalled that Washington in his last illness

had himself bled by his overseer before sending for a physician, indicating the menial character of the procedure.

It was an old saying:

"By bleeding, to the marrow commeth heat,
It maketh cleane your braine, relieves your eye,
It mends your appetite, restoreth sleepe,
Correcting humours that do waking keepe:
All inward parts and senses also clearing,
It mends the voyce, touch, smell & tast, & hearing."

"To bleed doth cheer the pensive, and remove
The raging fires bred by burning love."

Cupping, also, a form of bloodletting, which is as old as the animal horn with which it was executed by primitive peoples, was commonly resorted to. Among other popular therapeutic procedures were vomiting, sweating and blistering.

In seventeenth century Virginia roads were little better than bridle paths, in spite of country surveyors, laws, orders and indictments. "Until after the middle of the eighteenth century there were but few roads save bridle paths, and such as there were became impassable in rainy weather. It was often necessary for the traveler to swim across a stream."

Throughout most of the counties a bridle path led to the doors of most of Virginia's citizens. Over such highways the colonial doctor made his way on horseback. With him he carried a full equipment in instruments and drugs in his saddle bags, which distinguished the physician of pioneer America.

The colonial physician of the seventeenth century has been described as follows:

"It does not require great imagination to see our seventeenth century doctor dressed in knee breeches and jerkin, perhaps adorned with periwig and cap; not given to church-going, but fond of ale, horse-racing and cuss words; husband of a multiparous wife; owner of a log cabin home or at best a frame cottage which he guarded with gun, pistol and scimitar; his road a bridle path and his means of conveyance a horse or boat. We find him caring for his patients in his own house; tutoring apprentices; reading old Latin text books by candle light, without spectacles; writing with a goose quill pen; sitting on a rough stool or bench; eating at a crude table from pewter dishes, without fork or table knife; having no knowledge of bath tubs; keeping his clothes in trunk or chest; sleeping, night-capped, on a flock bed in a bedroom shared by others; dividing his time, which he measured with hour-glass and sundial, among medicine, politics and farming; often in court, often a justice, member of Council or Assembly, and subject, like his neighbors, to military service."

MEDICAL FEES

The first fee bill passed by any of the colonies was enacted by the Virginia Burgesses in September, 1736. It sought to remedy the abuses of excessive fees and "unreasonable prices" for medicines. It clearly recognized the difference between surgeons and apothecaries who had only been through appren-

ticeships and "those persons who have studied physic in any university and taken a degree therein."

Virginia had practically no specie in the seventeenth century, and a primitive system of barter prevailed. Debts were paid with anything that had value, even with hens and beaver skins. There are many instances of corn being used. In 1636 Dr. John Holloway was awarded a barrel of corn in a law suit, and in 1642 Dr. Stringer paid a debt in corn. The real medium of exchange was tobacco.

Bargaining between doctor and patient was common. The patient wanted assurance of a cure. The expenditure of a doctor's time and skill was considered worth something, but the cure was worth more, and it was often so stipulated. In 1683 Dr. William Poole, of Middlesex County, was promised 2,000 pounds of tobacco for curing a case of blindness. If he failed he was to have only "reasonable satisfaction for his trouble."

Dr. Peter Plovier made a bargain with Thomas Kirby and family, of "Warrwicke County." He promised to administer "such Phisick, Medicines and Chirurgery as hee or any of his family shall have occasion to make use of" during their natural lives, in exchange for 100 acres of land.

His bill to John Gosling, March 22, 1658:

"For 2 glisters	040	
" a glisters	030	
" a potion Cord.	036	
For an astringent potion	035	
For my visitts paines & attendance	---	
For a glistere	030	
For an astringent potion	035	
For a cord. Astringent bole	036	
For a bole as before	036	
For a purging potion	050	
For a cordyall luleb	120	
For a portion as before	036	
	1284	(pounds of
Allowed	1084	tobacco)

(Signed) John Cluloe"

William Fleming's account book for 1768 illustrates the more usual surgery of the day:

Drawing tooth for Negro Wench	0—2—6
Opening a Tumor & Dressing	3—0—0
Opening his breast & Extracting pin . . .	2—8—2
Amputating leg & dressing	8—0—0

It took men of strong constitutions to withstand the hardships and heroic treatments of the times:

"... The old Gentleman who departed in his eighty eight year, has had a rupture about forty years, a secret, till his last Illness, to every Body save one Acquaintance, for that Mortifying he was forced to confess it: And such was his strength of Constitution, he struggled with the Conquerour for tenn days, after the Doctors had declared he could not live tenn Hours . . . "

After death came the next step was to arrange for the funeral, which was usually a gala occasion. A specimen of a funeral bill:

	lbs. tobacco
Funeral sermon -----	200
For a brieve -----	400
For 2 turkeys -----	80
For coffin -----	150
2 geese -----	80
1 hog -----	100
2 bushels of flour -----	90
Dunghill fowle -----	100
20 lbs. butter -----	100
Sugar and spice -----	50
Dressing the dinner -----	100
6 gallon sider -----	60
6 gallon rum -----	240

Some of the colonists did not approve of the usual excesses at the wakes and funerals:

Ralph Langley, "being very weak & Crazie," concludes his will in 1683 with a mild protest against such excesses: "I beseech yr honor that there be noe more charge at my funerall than what the plantation will aford onlly 6 gallons of strong Drink."

Another protest is voiced in the will of Captain George Jordan, a leading planter of Surry County, in 1677; he requests that he be buried in "Major Browne his Orchard, & that at my buriall there may be no Drunkeness nor Gunns, but a good and decent funerall to Entertaine my ffriends & Neighbors . . ."

LAY MEDICINE

Plantation and parish medicine was largely practiced in Virginia. The Virginian was fond of exchanging his medical knowledge with his neighbor, and the plantation with its large population of dependent blacks gave him ample opportunity to put his learning to practical purpose.

In the ante bellum south slave practice formed a large part of the doctor's daily work. For many reasons the best physicians were glad to engage in it. Wealthy masters demanded the best medical attention for their slaves and were willing to pay well for it.

But there were other ways of meeting sickness on the plantation. The practice of prescribing for one's self and family, at least in minor ailments, was common in colonial Virginia, and the physician often was not summoned until the complaint had become serious.

When all is said, however, the health of the slaves rested largely in the hands of the overseers. Most plantation owners gave explicit directions governing the management of sickness among their negroes.

Francis Taylor's invaluable diary also gives evidences of the home treatment of slaves. Hearing that a snake had bitten his negro, Frank, he promptly applied "salt & dough & weed," remarking, "I staid till evening when he was easier & could walk though still swelled." When Molly scalded her hand, he

"sent for linseed oil." Two days later he noted, "Frank is sick. Gave him dose of saltz." On March 14, 1788, the diary records Taylor's treatment of Moses, who was thought to have pleurisy: "I gave him 25 grains of ipecac, but understand it operated downwards. Also gave Milly the same quantity for vomit, I gave her last Monday a dose of salts. She complains of pain in the head for about a week." A few days later, "I gave a vomit to Davey this morning—he has complained of a lax for several days." By way of commentary on his treatment of Moses' pleurisy the week before, he wrote on August 21, "set Moses to getting rales for yard." We soon find him prescribing for Frank again: "Gave Frank jalap." Some time afterward: "Davey complained of Pain in his side and breast—I gave him 24 grains of jalap & 8 of ipecac." Again, "Moses was taken very unwell. Gave him purge of jalap." Later, "gave Sarey a dose of castor oil." A few days later, "Sarey complained of being worse. I sent for C. Taylor." Still later, "Sarey says she is worse. Gave her two doses of Bark & Rhubarb. 20 Bark, 5 Rhubarb."

The famous Capt. John Smith, Virginia colonist, practiced medicine when the occasion demanded. Once an Indian prisoner at Jamestown was almost smothered to death in his dungeon and so "pittiously" burnt that little hope was held out for his recovery. Smith promised the man's brother to "make him alive again." This he did by filling the sufferer full of aquavitae and vinegar and putting him before a fire to sleep. The treatment worked wonders. In the morning the wounds were dressed, and the prisoner and his brother "went away so well contented, that this was spread among all the Salvages for a miracle, that Captaine Smith could make a man alive that is dead."

Thomas Jefferson was greatly interested in botany and was probably better versed in medicine than the average doctor of his day. In his library were many books bearing on medicine, and he read them intelligently. Jefferson undoubtedly practiced on himself and his "family" of negroes. We find an instance in a letter to Madison. "I am sorry to hear of the situation of your family," he wrote, "and the more so as that species of fever is dangerous in the hands of our medical boys. I am not a physician & still less a quack but I may relate a fact. While I was at Paris, both my daughters were taken with what we formerly called a nervous fever, now a typhus, distinguished very certainly by a threadlike pulse, low, quick and every now and then fluttering. Dr. Gem, an English physician, attended them."

He once treated himself for a "stricture of the ilium" and expressed the opinion that he would soon have been well "but that a dose of calomel and jalap, in which were eight or nine grains of the former, brought on a salivation."

CLERGYMEN

In New England drugs were carried by itinerant preachers, who sold their wares to grateful parishioners for whom frontier isolation made purchasing difficult. There is no record of such a method of distribution in Virginia, though there is nothing to indicate that it did not occur.

The clergymen and the parish authorities in colonial Virginia entered into the practice of medicine.

The Reverend John Clayton, minister at Jamestown, 1684-86, shows great

alarm in a letter, probably written to Dr. Boyle, over "the Distemper of the Colick that is predominant and has miserable sad effects it begins with violent gripes wch declining takes away the use of limbs. Their fingers stand stiffly bent, the hands of some hang as if they were loose at the wrists from the arms, they are skeletons so meagre & leane that a consumption might seeme a fatning to them, cruelly are they distracted with a flatus, & at length those that seemeingly recover are oft troubled with a sort of gout."

QUACKS IN VIRGINIA

The historian, William Smith, of New York, declared in 1757 that "quacks abound like locusts in Egypt. We have no laws to protect the king's subjects from the malpractice of pretenders. Any man at his pleasure sets up for physician, apothecary and chirurgeon. No candidates are either examined, licensed or sworn to fair practice."

The same conditions obtained in Virginia. In 1761 the Virginia students studying medicine in Edinburgh, "beholding with inexpressible concern the unguarded state of physic in our native country which lies open to the intrusion of every pretender to the medical art," memorialized the House of Burgesses. They demanded laws to remedy the public evil and asked that no one in the future be allowed to practice medicine without being "properly licensed and honored with a doctor's degree." Arthur Lee wrote from Edinburgh to his brother in Virginia, suggesting the registration of diplomas in the county courts as the surest method of preventing irregular practice.

In Rind's Virginia Gazette for November 1, 1770, the sheriff of Loudon County advertised for the capture of William George, "by profession a doctor, and practiced as such for more than two years in these parts," who had "run away from his bail" the previous July. The sheriff judged, from notes in George's prayer book, that he was born July 20, 1746, and came from Gloucester, England. He "carried with him some instruments belonging to surgery, which I believe he understands. As he has several fine ruffled shirts no doubt he will endeavour to pass for a Gentleman, being a pretty good scholar."

"This is to give notice that Mr. Richard Bryan, living in King George County, is most excellent at curing the Iliack Passion, or the Dry-Gripes, the cure of which he is dextrous into Admiration; for he has often performed the Cure with one Dose, after the Patient had been given out as incurable, by some very eminent Physicians, and never has yet failed of any he took in Hand."

Colonel Byrd, stopping at Tuckahoe on one of his excursions up the James, used the flux as a topic of conversation to "bring (Mrs. Randolph) to the Use of her Tongue." "I discover'd she was a notable Quack," he explains, "and therefore paid that regard to her knowledge, as to put some questions to her about the bad distemper that raged then in the Country. I mean the Bloody Flux, that was brought us in the Negro-ship consigned to Colo. Braxton. She told me she made use of very simple remedies in that case, with very good success. She did the Business either with Hartshorn Drink, that had Plantain Leaves boil'd in it, or else with a Strong decoction of St. Andrew's Cross, in new milk instead of water. I agreed with her that those remedys might be very good, but would be more effective after a dose or two of Indian Physick."

In 1711 the first American patent medicine appeared. It was called "Tus-

carora Rice," and was sold by a Mrs. Masters as a consumption cure. This was the period of traveling Indian medicine men and peripatetic quacks. The New Jersey State Medical Society in 1772 had a law passed prohibiting both the practice of the healing art and the sale of medicines by "mountebank doctors."

A little less offensive are the repeated advertisements in eighteenth century newspapers by really reputable physicians. The medical profession of that day availed itself of the public press to announce a new partnership, a change of residence, a particular method of therapy, or a new line of drugs, just received from England; and when they could get a hearing physicians took the advocacy or defense of their medical theories before the bar of public opinion.

During the seventeenth century, the young crown colonies enjoyed only the most primitive medical facilities and put forth no academic efforts. This state of affairs changed to some extent during the eighteenth century, especially during the latter part of the century.

Many Virginia youths during the eighteenth century took advantage of opportunities for study abroad and as a result acquired a preeminence in their profession upon their return to practice in America.

Medicine was not taught systematically in this country until the latter part of the eighteenth century. In 1765 William Shippen and John Morgan founded the medical department of the College of Philadelphia, which soon became the University of Pennsylvania.

A medical department existed at William and Mary for a short time during this century. With the reorganization of the college in 1779 and the appointment of James McClung as professor of anatomy and medicine, opportunities were offered to Virginians similar to those in other colonies. The school, however, functioned only three years.

Before 1800 there were but four medical periodicals published in England and only one in America, the MEDICAL REPOSITORY, established in New York in 1797. The first issue of this American journal contained two items from Virginia. In one "A correspondent of the NORFOLK CHRONICLE recommends as a means to restore infectious air to purity, to wet a cloth of any kind in water mixed with quick-lime, and to hang the cloth so steeped in a room till it becomes dry; after which to renew the operation as long as appears needful."

The mainstays of treatment in the eighteenth century continued to be calomel, opium, ipecac and the famous rattlesnake root. Each had its indications and was given by plantation owner and doctor alike with confidence. "Copious bleeding and the use of mercury" were described by a Virginia doctor as late as 1805 as having cured a case of hydrophobia. When erysipelas was believed to be "fixed on the stomach," it was brought to the surface by tartar emetic plasters.

A letter from Thomas Jones written during an illness in 1725 shows him resigned to the inevitable: "It seems before ye Doctor proceeds any further on his part, he wants ye operation of Nature, who I am afraid will treat me very roughly, and who I suppose is taking her rounds this sickly time. . . . I may suppose I am to wade through Rivers of water gruel, & Chicken Broth

strengthened with mollasses with no other support than ye yolks of four poached eggs once a day without bread or salt . . ."

A fairly good idea of the medical treatment which Virginians of this century received may be had from an inspection of the list of medicines ordered by George Washington in 1767 from his London factors, and intended for the negro slaves and his family at Mount Vernon:

"2 best Lannets (lancets) in one case.
 6 common Do. each in sepe.
 25 lb. Antimony.
 10 lbs. flour of Sulphur
 2 Oz. Honey Water.
 3 Quarts Spirits of Turpentine.
 2 lb. best Jesuit's Bark, powdered.
 3 Oz. Rhubarb Do. and put into a bottle.
 1 pint Spirit of Hartshorn.
 6 oz. Do. of Lavendar.
 6 Do. Do Nitre.
 1 lb. Blistering Plaister.
 4 Oz. Tincture of Castor.
 8 Do. Balsam Capivi.
 1-4 lb. Termerick.

AMERICAN SURGERY

(See additional data in Surgeons & Surgery Chapter)

In America surgery can hardly be said to have existed until the Revolutionary War. Several factors were responsible for this improvement. There was the example of the superior surgery practiced by the surgeons attached to the foreign armies operating in this country during the Revolutionary War. The war moreover furnished a wealth of surgical material. "No wonder bold surgeons developed out of such training. John Warren of Boston in 1781 amputated the shoulder joint, John Bard of New Jersey in 1759 performed laparotomies for extra-uterine pregnancy, William Baynham of Virginia in 1791 and 1799 performed the same operation, and Wright Post of New York in 1796 operated for femoral aneurism by the Hunterian method."

Among the prominent physicians in the Colonial War were Drs. William Flemming, Thompson Sawyers and Dr. Thomas Walker, who also was a noted explorer. Dr. Walker has been credited by at least one authority with having been one of the earliest to trephine bone for suppurative osteomyelitis. Andrew Robertson, native of Scotland, graduate of the University of Edinburgh, and military surgeon attached to the British army in Flanders, came to America with Braddock in 1755 and took part in the ill-fated expedition against the French and Indians. Shortly afterward he quit the army and settled in Lancaster County, Virginia.

In Virginia the "chirurgion" finally had disappeared. In his stead we have the surgeon—a much more respectable member of society, but one still not quite able to shake off entirely the unpleasant aura of the barber, bone-setter and stone-cutter from whom he had sprung. In the old world, where proprieties and conventions counted for much, the opprobrium attached to the surgeon continued to linger.

The exigencies of life in the new world did not make for the sharp cleavage and distinction between physicians and surgeons that obtained in Europe. In America it was more convenient as well as more profitable to be a jack of all trades, and more and more doctors began to advertise themselves as physicians and surgeons, some adding a third profession, that of "man mid-wife."

HOSPITALS IN AMERICA

"Hospital management was bad in the seventeenth century the world over. It was worse in the eighteenth. There was the same overcrowding, several patients occupying one bed or pallet, the same absence of ventilation, the same presence of vermin and filth, the same lack of appreciation of the need for isolation of contagious diseases, the same misdirected effort at nursing, the same fatal issue following every attempt at major surgery. The mortality in the general hospitals of the period could not have been less than twenty per cent."

The fearful mortality that accompanied hospitalization in America at this time received further comment from Dr. Thatcher, who wrote, "it has been estimated that the loss of lives in the various armies of the United States during the war is not less than 70,000. The number who died on the horrid prison ships of the enemy cannot be calculated. It is however confidently asserted that no less than 11,000 of our brave soldiers died on board the one called Jersey Prison Ship only."

THE FIRST MARINE HOSPITAL IN AMERICA

On April 15, 1708, the Council ordered "that a house be hyred for the accommodation of the sick men belonging to her Majesty's Ship the Garland and that the Rent of the said house be paid out of her Majestys Revenue of two Shils per hogshead and it is recommended to Collo William Wilson to provide a house accordingly." However, it was not until 1780 that steps were taken to establish a permanent marine hospital.

THE HOSPITAL FOR THE INSANE AT WILLIAMSBURG

On November 15, 1769, a committee was instructed to prepare a bill "to make Provision for the Support and Maintenance of Ideots, Lunatics, and other persons of unsound Minds."

The act to care for the insane, as it was finally passed by the Burgesses on June 27, 1770, took cognizance of the fact that "several persons of insane and disordered minds have been frequently found wandering in different parts of this colony."

During the sixteenth, seventeenth and eighteenth centuries the treatment of the insane was at its worst. No sympathy was extended to them; unspeakable atrocities were committed upon them; they endured incredible suffering. They were chained in dungeons, beaten, tortured, or exhibited as curiosities to the people of a Sunday afternoon.

Virginia enjoys the reputation of having established at Williamsburg in 1773 the first insane asylum in America. In the seventeenth century, however, the barbarous ideas current on the Continent in regard to the management of

the insane prevailed here also. The violent were chained or caged, the harmless were allowed at large. These poor creatures were drugged with camphor, opium or belladonna; purged, vomited and bled; kept in prison and in mechanical restraints, until Philippe Pinel introduced the modern humane treatment. It was late in the eighteenth century before the change came.

In spite of all the therapeutic extremes in Virginia during the eighteenth century there were many worth-while physicians:

William Baynham was born December 7, 1749, in Caroline County, Virginia. His father, Dr. John Baynham, had long practiced in that community and served as both magistrate and vestryman. Like many other sons, William followed in his father's footsteps and at an early age was apprenticed to Dr. Thomas Walker, of Castle Hill, Albemarle County, one of the most eminent men of his day.

William Baynham was the finest anatomist of the century in America. He was not attached to one of the five medical schools started in this country before the turn of the century, nor was he a resident of a large northern city. He practiced surgery and medicine in rural Virginia and affords a striking example of pioneer surgery outside of the principal American medical centers.

Jessee Bennett, in 1794, successfully performed on his wife the formidable operation of Caesarean section, at the same time removing both ovaries. This was the first operation of its kind in America, done thirty-three years earlier than that by John Lambert Richmond, who, according to Garrison, performed the first Caesarean section in this country at Newton, Ohio, on April 22, 1827. Bennett did not report the operation, therefore, he has not been given a place of honor in the medical history of America. When asked why he did not report his case in some medical journal, Bennett replied that "no doctor with any feelings of delicacy would report an operation he had done on his own wife," and added that "no strange doctors would believe that operation could be done in the Virginia backwoods and the mother live, and he'd be damned if he would give them a chance to call him a liar."

William Cabell, in 1744, was a justice of Albemarle. Later he became coroner and assistant surveyor. By 1753 he had acquired 26,000 acres of land. He was an interesting frontiersman, described as "ready to turn his hand and mind to whatever turned up, dispensing justice, surveying lands, amputating a limb, curing a wound, physicking his neighbor, bartering or fighting with Indians, or what not." Importing his medicines, he dispensed them in his own apothecary shop, along with medical products concocted from native plants. His materia medica included Turlington's Balsam, Bateman's Drops, Stoughton's Bitters and Anderson's Pills. He frequently prescribed rhubarb but used very little calomel. Near his home he conducted a private hospital where he performed major operations, patients paying for board and necessities but usually not remunerating the doctor unless cured. Charges for cures ranged from five to one hundred pounds. If the patient died, Dr. Cabell's artisans supplied the coffin and buried him. An item in his account book reads: "To coffin, sheet and interment, pounds 2- 11s.-6d." This remarkable man, whose sayings were long quoted in the neighborhood, died April 2, 1774, 'after a long and tedious illness' and is buried at the present Liberty Hall estate."

Theodorick Bland (1740-1790), described by a well-known historian of the

Revolution as poet, soldier and legislator, went through a long and thorough medical training in the best universities of Europe and for seven years practiced his profession in the colony. In 1765 he returned to Virginia.

At the end of seven years he abandoned the practice of medicine and made the following explanation:

"With a constitution weak and infirm from my cradle, I buffeted the winds and faced the weather in all its extremes from the severest cold to the most intense and scorching heat; I exposed myself to every inclemency both by night and by day; and have for near seven years undergone all the distresses, cares and anxieties, which are the constant and unremitting attendants of a conscientious practitioner of physic, and all this in direct opposition to my leading and strongest inclinations to a calm, quiet, and philosophical life in a rural situation, and with a loss of every social and domestic enjoyment; for what enjoyment of time can a man have who is subject to perpetual alarms? My resolution to renounce the practice of physic is not the effect of whim or caprice, but of absolute and cogent necessity."

James McClurg, though he could not support his family from his profession, made medicine his mistress and adhered to it with a devotion that won the respect of his contemporaries all over the country.

Arthur Lee, Walter Jones, John Mitchell, Elisha Dick, William Brown, George Gilmer, James Greenway, John M. Galt, William Foushee, Robert Wellford and others, were recognized beyond the confines of the colony for their attainments in medicine, while there were many lesser lights who were highly esteemed by their fellow Virginians.

MEDICINE IN THE NEW ENGLAND SECTION

Samuel Fuller (1580-1633), the doctor of the Mayflower, was born and baptized at Redenhall Parish Church in Norfolk County, England, January 20, 1580. In the negotiations and preparations for fitting out the "Speedwell" and the "Mayflower" (1617-20) Fuller was an active and influential party.

In the list of passengers sailing on the "Mayflower" the occupation of Samuel Fuller is given as physician, "and the vocations were as far as ascertained the callings the individuals who represented them had followed before taking ship."

It has been said that the "Mayflower" had a surgeon (Giles Heale), but nothing is recorded about him other than his signature to William Mullins' will. Mullins died February, 1621, on the "Mayflower." There is no other mention of this surgeon either as a passenger or sailor on board the "Mayflower."

In June, 1630, Doctor Fuller wrote: "I have been to Matapan (now Dorchester) and let some twenty of these people's blood." Again, in August, 1630, while at Charlestown, he writes: "There is come hither a ship (with cattle and more passengers) on Saturday last which brings this news out of England; that the plague is sore, both in the city and country, also there is like to be a good dearth in the land by reason of the dry season; the sad news here is that many are sick and many are dead; I here but lose time and long to be at home. I can do them no good, for I want drugs and things fitting to work with."

In the epidemic of smallpox which prevailed in 1633 many fell sick and about twenty died, men, women, and children, including many of the old settlers from Holland, among whom was Samuel Fuller (after he had much helped others) and "had been a great help and comforte unto them; as in his faculties, so otherwise, being a deacon in ye church, a man godly, and forward to doe good, being much missed after his death: and he and ye rest of their brethren much lamented by them, and caused much sadness and mourning amongst them."

In New England drugs were sold by itinerant preachers to their parishoners. It has been said: "New England medicine in the seventeenth century is as dreary as its literature and as repellent as its theology."

The following advertisement appeared in *THE BOSTON GAZETTE*, June 19, 1744. The advertiser, Mr. Gardiner, was not only the most noted druggist in New England, but also an accomplished physician and surgeon:

"Just imported in the Ship from London, And to be Sold By Mr. Sylvester Gardiner, At the Sign of the Unicorn and Mortar in Marlborough Street.

"All sorts of Drugs and Medicines, both Chymical and Galenical; where all Doctors, Apothecaries or others, may be supply'd with the very best and freshest of Either at the lowest Price; and Captains of Ships with Doctor's Boxes put in the neatest and best Manner; with printed Directions: Likewise all Merchants may be furnished at the same Place with Surgeons Chests put up in the same manner, and at the same Price, as they are for the Royal Navy, at the Apothecary's Hall in London; where only are to be sold by appointment of the Patentees, the true Doctor Bateman's Pectoral."

The following advertisement is taken from the *NEW ENGLAND COURANT* of December 17, 1772. The substance of it is much like the quack notices of the period:

"For the good of the publick, a certain person hath a secret medicine which cures the gravil and cholick immediately, and dry belly ach in a little time; and restores the use of the limbs again (tho' of never so long continuance), and is excellent for the gout. Enquire of Mr. Samuel Gerrish, bookseller, near the Brick Meeting House, over against the Town-House in Boston. N. B. The poor who are not able to pay for it, may have it gratis."

For many years before the Puritans came to this country, being subjected to bitter persecution, and foreseeing the possibility of an ejection, a considerable number of their ministers studied medicine. They saw the probable needs of the future, and fitted themselves as best they could for any emergency that might arise in a new settlement, hence they formed a large proportion of the early physicians of Massachusetts. History repeats itself, and we see to-day American missionaries who first study medicine as a partial preparation for their new duties.

In the year 1649, a law was passed to regulate, within certain limits, the practice of medicine and surgery, and required the practitioner to act according to the most approved precepts of the art in each domain.

Dr. Oliver Wendell Holmes occupied the chair of anatomy at Harvard for thirty-five years. His humor was often carried over to his medical labors. Small, smiling, asthmatic, Holmes was always ready to battle for science.

The following is his opinion of *materia medica* as used at that time:

"Throw out opium, which the Creator himself seems to prescribe, for we often see the scarlet poppy growing in the cornfields, as if it were foreseen that wherever there is hunger to be fed there must also be pain to be soothed; throw out a few specifics which our art did not discover, and is hardly needed to apply; throw out wine, which is a food, and the vapors which produce the miracle of anesthesia, and I firmly believe that if the whole *materia medica*, as now used, could be sunk to the bottom of the sea, it would be all the better for mankind—and all the worse for the fishes."

During those early days the ministers, who were often doctors as well, were very expert in phlebotomy and they always resorted to bleeding, as well as praying, in all severe cases of sickness.

In the early days of New England, it was not customary to address or speak of a physician by the title of Doctor. Perhaps one reason for this was that there were so very few persons who had ever taken a medical diploma. The custom of giving the title has literally grown up by degrees.

The earliest date at which we find the title Dr. substituted for surgeon and physician in America is in New England about 1769. Since that period it has become common throughout the United States, and the popular appellation of "doctor" is now almost exclusively given by the people to the medical practitioner when speaking to him, and the term physician used more generally when speaking of him.

Benjamin Rush (1745-1813), the "American Sydenham," as he was termed by Lettsom, was born in Byberry Township, Philadelphia County, on December 24, 1745. Rush is the outstanding figure in early American medicine. His family were English Quakers, but, curiously enough, both his father and grandfather were gunsmiths.

Upon the death of Dr. John Morgan in 1789, Rush succeeded him as professor of the theory and practice of medicine in the College of Philadelphia. When, in 1791, that institution was merged with the University of the state of Pennsylvania, to form the University of Pennsylvania, Dr. Rush was appointed professor of the institutes of medicine and clinical medicine.

When he was a young man he wrote: "Medicine is my wife; science is my mistress; books are my companions; my study is my grave, there I lie buried, the world forgetting, by the world forgot." In the latter part of his life, after having married a wife and begot thirteen children by her, he writes in treating of the causes of insanity, "celibacy is a pleasant breakfast, a tolerable dinner, but a very bad supper. The supper is not only bad, but, eaten alone, no wonder it sometimes becomes a predisposing cause to madness."

Some of his admirers called him the "Hippocrates of Pennsylvania."

SEE AMERICAN PHARMACY CHAPTER FOR DR. JOHN MORGAN.

SEE AMERICAN PHARMACY CHAPTER FOR DR. HUGH MERCER.

William Shippen (1736-1808), was an army surgeon with Washington. He, with Morgan, has the distinction of being the founder of the first medical school in America, that which is now the medical department of the University of Pennsylvania. Shippen, Rush and Morgan, practicing mostly in the eighteenth century, were the three men responsible for the lusty start of medicine in

America after the revolution. Besides them there were no outstanding men in American medicine during this period.

We can partially visualize them through their joint accomplishments. There were, for example, before the close of the eighteenth century, five worthy medical schools in America—University of Pennsylvania, Kings College in New York, Harvard University, College of Philadelphia and Dartmouth College.

Dr. John Jones was the first American physician to publish a medical book. In 1775 he issued his *PRACTICAL REMARKS ON THE TREATMENT OF WOUNDS AND FRACTURES* in New York City.

James Thacher, the earliest medical biographer, began his first series of biographies in 1827, and, in 1813, Dr. James Tilton published his famous *OBSERVATIONS ON MILITARY HOSPITALS*.

Herman van de Bogardet was the first physician mentioned in connection with the life of New Amsterdam, later New York. These company physicians as a rule were not permanent members of the colonies, but from 1650 onwards medical men became fixtures in the new colonies.

In the New England group John Fisk, Thomas Oliver, Samuel Seabury and many others became prominent in medicine.

MEDICINE IN NORTH CAROLINA

Medicine in North Carolina during this period was, on account of its proximity, practiced the same as in Virginia.

The following are some of the eighteenth century advertisements:

"Doctor Ward wishes to thank the public for the kind reception given to his purging cake. Ward's Anodyne Pearls 16 in a paper for only 1s and that to be returned to any buyer who shall say they have not answered the character here given. . . . To preclude the attempts of imposture, by any imitation, Doctor Ward will sign his name with red ink, on every paper of printed directions that will be given along with them." (*The Cape Fear Mercury*, Dec. 29, 1773.)

"To be sold. . . . Stoughton's excellent London Bitters, being a grand Preventative against the Ague and Fever, and giving Strength and Digestion to the Stomach: Also some Cases of genuine Cordials." (*North Carolina Gazette*, Feb. 24, 1775.)

"For sale, . . . Dr. Stephany's incomparable gold tincture, also his infallible ague pills (sold by no other person in this state)." (*The State Gazette of North Carolina*, March 2, 1788.)

"Any person that will dispose of their Front Teeth (slaves excepted) may receive Two Guineas for each, by calling on Doctor Laymeur. For further particulars enquire of the Printer." (*North Carolina Gazette*, Feb. 16, 1786.)

MEDICINE IN SOUTH CAROLINA

Dr. William Bull was the first native South Carolina physician of note, and the first American who received the degree of M. D. This was granted at Leyden in 1734, his thesis being on "*Colica pictonum*." He died July 4, 1791, aged eighty-two.

Dr. John Moultrie was the next South Carolinian who received the degree of M. D., which was granted in 1749, from Edinburgh. He commenced practice in Charleston as early as 1733, and for forty years was the most celebrated physician and popular obstetrician in the state or in the South. It is probable that his devotion to obstetrics antedates that of any other physician in America.

MEDICINE IN CALIFORNIA AND THE SOUTH-WEST

The scalpel marched step by step with the cross and sword in all the explorations of the early Spanish settlers and this close association was kept until the time of the American settlement of California.

Fathers Kino and Salrúa-Terra of the Jesuit Order started missions in Lower California in 1697. Coronado and Juan de Onate established missions in New Mexico prior to 1598, and Vizcaino in 1602 visited Alta California, now known as California, to prepare the way for missions.

Californian Indian medicine with its most interesting, fantastic, and weird practices yielded slowly to the Old World's white physician's methods of bleeding, blistering, cupping, and physicking. The advent of the white man in California was really when the Spanish padres came up from Baja (Lower) California in 1769 to found missions among the Indians.

Therefore, the white man's history of California goes back to the cradle of the new Spanish province when the sword, cross, and scalpel proceeded hand in hand. Dr. George Lyman wrote, "Had it not been for the presence of Dr. Pedro Pratt, it is probable that the projected province would have miscarried and never withstood the travail of its birth."

The complete list of surgeons-general who resided at Monterey, the medical center, and carried on during the Spanish reign in California were ten.

While myth surrounds the representatives of Indian medicine, real facts come down to us, through written Spanish mission records, concerning these ten doctors who were of such stellar stuff that they were recipients of king's commissions.

Pablo Soler (1791-1800), was the outstanding medical authority during the days of the Spanish rule in the province called California. Of him the written records state, "He made long, arduous horseback rides, visiting the presidios and caring for the sick officers, soldiers, Indians, settlers, and priests." Starvation and sickness were a common lot.

That Spanish doctors were aware of the contagiousness of pulmonary tuberculosis, or phthisis as they called it, is shown by the following: "Morelos caused to be burned the bedding, clothing, and house (after the plaster was removed) of a man who died from this disease."

Benites was a medical writer as well as an observer, for he furnished (1804), at the suggestion of the Mexican Viceroy, an able and exhaustive report of the diseases he encountered and their treatment, to the authorities in the capital of Spain. Wounds (dueling was frequent), scurvy, fractures, dysentery, sore eyes, dropsy, gonorrhea, syphilis, dementia praecox, varicose veins, fevers, plethoræ—thus the record runs.

The first doctor on Rich Bar on the Feather River was Fayette Clappe. A few weeks later he had twenty-nine associates and all had plenty to do, for

a page from his wife's diary reads: "In one period of twenty-four days we have had several murders, many fearful accidents, bloody deaths, whippings, a hanging, an attempt at suicide, and a fatal duel—these are stirring times!"

SPANISH, MEXICAN AND AMERICAN PRACTITIONERS

The history of medicine and the medical men of this portion of the United States falls naturally into three pretty distinct periods, namely, the Spanish, the Mexican, and the American eras. The settlement of Upper California by the Franciscan friars and the Spanish Government in 1769 may be regarded as the beginning of the Spanish medical era.

The Spanish Medical Era was marked more especially by the activities of the Franciscan friars. Father Junipero Serra, the president and leader of the Franciscan missionaries and the founder of the Missions, a native of Spain, was an early and earnest student of the medical value of the flora of this region. Largely through his influence, the padres became more or less adept in the use of the indigenous drugs in the treatment of human ills. Father Serra's work in the control of scurvy by the use of the juice of the citrus fruits was a service well worthy of commendation.

The Mexican Medical Era (1822-1846) was distinguished by the arrival of three pioneer physicians—Dr. John Marsh, who came to Los Angeles in January, 1836; Dr. Richard S. Den, who arrived in California in 1843; and Dr. John S. Griffin, assistant surgeon, U. S. A., who arrived in 1846.

The American Medical Era began with our war with Mexico, in 1846. During this period, the growth of the medical profession kept pace with the rapid increase of population and advance of civilization in this region.

Tularemia has the distinction of being the first truly American disease. It was discovered by the United States Public Health Service and nearly all of the knowledge concerning it has been elucidated by the physicians of that organization. They also named it.

The name goes back to the time when California was a Spanish possession. In certain marshy places there grew a variety of bullrush called by the Spaniards and Mexicans *tule*. The areas where these reeds grew abundantly were named *tulares*. The story of the disease tularemia commences shortly after the San Francisco fire of 1906.

INDIANS OF THE SOUTH-WEST

In general, the morbid conditions that occur frequently and those that occur more rarely among the South-Western Indians than among average white Americans are as follows:

Frequent in Indians: Affections of the gastro-intestinal tract, affections of the respiratory organs, affections of the eyes, muscular and senile arthritis, smallpox, measles, malaria, dysentery.

Rare in Indians: Anemia, affection of breast, diseases of heart, arteries, and veins, asthma, affections of the liver, affections of the female sexual organs, many affections of the skin, dental caries, cancer, rachitis (high grade), insanity, nervous diseases (excepting epilepsy), scarlatina, bone fracture.

In every Indian tribe there were a number of persons, called medicine men by the whites, who were regarded as the possessors of supernatural powers which enabled them to recognize and cure disease. They were believed to have received their powers from some supernatural being, either as a direct gift, or as the result of instruction by some person who had received such powers.

The methods used to work cures varied with the nature of the disease and the customs of the medicine men. Diseases of unknown origin and those ascribed to witchcraft could only be treated by some one who could work a counter spell. Such diseases were usually eradicated by sucking a feather, small stone, blood, or some other object from the patient, singing and the shaking of a rattle being part of the performance.

Methods of opening veins for the purpose of blood-letting are known to many quite uncivilized tribes. Central Californian Indians used to open the veins of the right arm for diseases of the trunk, and of the left arm for diseases of the extremities. They have always had faith in the actual cautery, using red-hot needles, made of bone or flint or shell, for relieving rheumatic pains.

The greatest accomplishment of American medicine is Anesthesia, which will be treated in Modern Medicine.

MEDICINE IN THE NINETEENTH AND TWENTIETH CENTURIES

CHAPTER XI (MODERN MEDICINE)

IN THE NINETEENTH CENTURY ROBERT MASSENGILL PORTER DEVELOPED THE MEDICAL DEPARTMENT OF THE UNIVERSITY OF NASHVILLE, WHICH BECAME THE LARGEST MEDICAL COLLEGE IN THE SOUTH AND THE THIRD LARGEST IN THE NATION. HE BECAME ITS FIRST PROFESSOR OF ANATOMY AND PHYSIOLOGY AND WAS RECOGNIZED AS ONE OF AMERICA'S MOST BRILLIANT STUDENTS OF THE FORM AND FUNCTION OF THE HUMAN BODY.

"THERE WAS GENIUS IN THE NEW DEPARTMENT, THE COMPOUNDED GENIUS OF JOHN BERRIEN LINDSLEY, PAUL EVE, JOHN M. WATSON, W. K. BOWLING, A. H. BUCHANAN, C. K. WINSTON, AND ROBERT MASSENGILL PORTER, AS BRIGHT A GROUP OF LUMINARIES AS EVER SHED RADIANCE UPON AN AMERICAN MEDICAL CAMPUS."

Clinical medicine was evolved in the eighteenth century, after attention had been given to the importance of pathology and post-mortem examinations of diseases, and this work led to better diagnostic practices.

Modernization of medicine began in the nineteenth century with the extension of physics, chemistry and biology, all branches of medicine and surgery developed with rapid strides.

The nineteenth century was an era of almost incredible accomplishments, and we feel that it is ours, for there is a sense of proximity to the nineteenth century that is absent from our thought relationship to the preceding eighteen centuries.

Systems had seen their best day by this time and the first half of the nineteenth century was a period of transition, and there was a tendency to stabilize knowledge on the basis of facts. The early part of the nineteenth century was merely an appendage of the eighteenth; the last half of the nineteenth century, a period that we may justly characterize as the glitter time of medicine, leading onward into a more brilliant future. However, we must not make the error of thinking all was well during the wonderful nineteenth century, for we encounter several types of medical prostitution.

Mesmerism has already been mentioned under Quacks.

Francis Schlatter in 1893 left Denver, Colorado, and wandered as far as New Mexico, bareheaded and barefooted, over the mountains and plains, led, as he asserted, by divine inspiration. He returned to Denver as a faith healer, and his fame grew until he was visited by patients from all over the United States. Each day a line of four or five thousand people formed before his house, where he stood behind a picket fence to touch each sufferer that filed past him.

John Alexander Dowie was a faith healer, whose work has extended well into the twentieth century. For some years he was connected with the Divine Healing Association, but eventually he broke away from this organization and

established the Christian Catholic Church which after 1901 was centered at Zion City, a suburb of Chicago. Dowie maintained that disease was the work of the devil and that prayer and the laying on of hands was a cure for it.

Phineas Quimby, of Maine, was an outstanding faith healer of the nineteenth century. His importance comes not so much from his own work as from the influence he exerted in the origin of New Thought and Christian Science. Quimby began faith healing with the use of hypnotism, which was then called animal magnetism.

During his early days as a practitioner of faith healing Quimby's method of treatment consisted in sitting beside his patient—usually a woman—putting his left hand on her bare abdomen, and with the other hand rubbing her head. He told the patient that in so doing animal magnetism flowed out of his body into hers and that the animal magnetism thus acquired would cure her.

Quimby's metaphysical conception of disease led directly to the founding of Christian Science. Its organizer, Mrs. Mary A. Morse Baker Glover Patterson Eddy, was born in Bow, New Hampshire, about 1821. As a child she was said to be neurotic and subject to fits of nervousness which interfered with her schooling. At the age of twenty-two she married George Washington Glover, a stone mason, who died six months later and before the birth of her only child. During ten years of widowhood she stayed with relatives and had long periods of illness of a hysterical character. In 1853 she married Daniel Patterson, an itinerant dentist, who deserted her in 1862 and from whom she subsequently obtained a divorce.

Her nervous disorders persisted in spite of—or because of—this unsatisfactory marriage, and she turned to Quimby for help. Under his ministrations her health improved, thus clearly showing the neurotic origin of her affliction. She studied Quimby's methods and, later, dates her discovery of the principle of Christian Science from the year of his death, 1866. Mary Eddy never quite succeeded in getting away from some of the ideas of animal magnetism which she had obtained from Quimby. Her cures had nothing to do directly with this belief, but she developed what would appear to be delusions of persecution and felt that malicious animal magnetism emanating from her enemies was producing many ills and had caused the death of her third husband, Asa Eddy.

To mention and describe the methods of the numerous faith healers, many of whom have reaped fortunes from the credulous, would require a large volume.

As offsets to the cults and quacks we have anesthesia, antisepsis and bacteriology as nineteenth century conquests, greater than which no other century has ever boasted.

A remarkable group of incisive thinkers and brilliant workers during the nineteenth century must be passed in review:

Leopold Auenbrugger (1722-1809) laid the foundations of anatomical diagnosis. He was a pupil of van Swieten, and from 1751 to 1762 was first assistant physician and then physician at the Spanish hospital in Vienna. It was there he began his experiments in tapping, in percussion, doing so directly with the finger-tips of one hand.

A man who wishes to know whether a barrel is full or empty taps it. Auen-

brugger was the son of an innkeeper, and must often have seen his father engaged in this simple operation.

Persons with "a good musical ear" learn percussion and auscultation far more speedily than those without musical gifts. Auenbrugger was an accomplished musician.

Claude Bernard (1813-1878), was a Burgundian, the son of a vine-grower. He was sent in early youth to Lyons as an apothecary's apprentice. There he began to write plays: a comedy, which had a fair success in a small theatre; and then a tragedy, with which he wanted to try his fortune in Paris. Certain art critics read his piece, and advised him to study medicine in preference to becoming a playwright. The upshot was that the apothecary's apprentice became a student of medicine.

He was a professor of physiology at the University of Paris, where a chair for him had been specially established. Simultaneously he was professor at the College de France as successor to his teacher Magendie.

Claude Bernard, working in a damp and gloomy hole, with apparatus constructed by himself, became the greatest experimental physiologist of his time.

Theodor Billroth (1829-1894) was the son of a pastor in the island of Rügen. He wanted to become a musician. Since his relatives dissuaded him from adopting this profession as one at which it would be hard to make a livelihood, he qualified as a doctor. All the same, he remained an artist, was an instrumentalist throughout his life. He qualified in 1852, took post-graduate studies in Vienna and Paris, and took up his residence as a practitioner in Berlin. In 1860 he accepted a call to Zurich, where he remained seven years.

In 1867, he became professor of surgery at Vienna, and remained at work in the Austrian capitol until shortly before his death at Abbazia in Istria on February 6, 1894. It was Billroth who worked out the methods of gastro-intestinal surgery. Above all his name will remain associated with the history of the surgery of the stomach.

Jean Nicolas Corvisart (1755-1821), a pupil of Desault, was the founder of modern clinical medicine in France.

Corvisart had originally been destined for the legal profession. At school he was not only diligent in his studies, but had distinguished himself by bodily vigor. His father was solicitor to the crown, and took the lad into his own office. Corvisart, however, found the copying of legal documents a tedious affair. Whenever he could, he escaped from this thralldom, made his way into the Latin Quarter, listened to one lecturer or another, visited the Hotel-Dieu (the largest hospital in Paris), and there gave ear to what Desault had to say. He found this fascinating. At length he broke away from his father's profession, and became a medical student.

In 1807, Corvisart became physician-in-ordinary to Napoleon, and his new duties tended more and more to withdraw him from his work as a clinical teacher. His practice increased from day to day, and his social obligations became more comprehensive. Napoleon was a difficult and exacting patient, but Corvisart got on with him very well. It is recorded that the Emperor once said he had no faith in medicine, but he had faith in Corvisart.

After the fall of the Empire in 1815, Corvisart likewise vanished from the

stage. He had been paralyzed by an apoplectic seizure, and retired to his country estate.

Paul Ehrlich (1854-1915) studied in Breslau, Strasburg, Freiburg, and Leipzig. He was mainly interested in histology and chemistry. Although Ehrlich, because of his seemingly haphazard "trial and error" methods, referred to his chemical researches as "play chemistry," he realized that his "chemical imagination" was his chief asset. This imagination made him the greatest biochemical philosopher of all times.

Ehrlich was not a good student, he was irregular in attendance, especially avoided the classes in chemistry, and after five years could not pass the required examinations. He remained another year, and was graduated to the great relief of the janitors. For Ehrlich was constantly playing with dye-stuffs, and never a neat worker, he squirted color-spots everywhere.

By following his lead August von Wassermann discovered the diagnostic test for syphilis. Ehrlich introduced the arsenical derivative—the six hundred and sixth of the series—for the sterilization of syphilis. As a therapeutic achievement, the production of salvarsan (606) and neosalvarsan (914) has never been surpassed.

Edward Jenner (1749-1823) was a native of Berkeley in Gloucestershire, England. His father was the vicar of Berkeley, and his mother was descended from an ancient family in Berkshire.

Round Berkeley, and elsewhere, the cows occasionally suffered from a malady in which pustules closely resembling those of smallpox appeared on the udders and the teats. Jenner called the illness "*variola vaccinae*"—cowpox. This malady was transmissible to human beings. The cowherds and milkmaids became infected from time to time with similar pustules, which appeared on their hands and arms. The trouble, however, remained purely local, the attendant general symptoms being of trifling importance, and there being no tendency to the outbreak of a generalized crop of pustules.

He wrote to his master Hunter, telling him he thought that on this fact could be based an attempt to secure acquired immunity to smallpox on a large scale. Hunter replied with the famous bit of advice, "Do not think, try; be patient, be accurate." Jenner did try, he was accurate and he was patient, making observations from 1788 until May 14, 1796, when he performed his first vaccination on a boy, using pus from the arm of a dairy maid infected with cowpox. About two months later the boy was inoculated with smallpox virus and proved to be immune. Previously, no one had suspected that vaccination, as Jenner called his discovery, was anything more than a curiosity of medicine.

Thus inoculation with smallpox was replaced by inoculation with cowpox. "Vaccination" was substituted for variolation, and a means had been discovered by which smallpox became a preventible disease. During the latter half of the nineteenth century, vaccination was made compulsory in most civilized countries, with the result that smallpox is now extremely rare.

Jenner's introduction of preventive inoculation for smallpox furnished medicine with one of her greatest victories.

Robert Koch (1843-1910) sprang from a miner's family and from early youth

showed a strong inclination toward scientific research. Koch, a native of Germany, took his medical degree at the University of Gottingen in 1866.

In 1876 Koch wrote to Ferdinand Cohn, who was then the leading authority on microscopic plants: "After many vain attempts, I have finally been successful in discovering the process of development of the anthrax bacillus. After many experiments, I believe to be able to state the results of these researches with sufficient certainty. Before, however, I bring this into the open, I respectfully appeal to you, esteemed Herr Professor, as the foremost authority on bacteria, to give me your judgment regarding this discovery."

Cohn asked leading investigators to examine his new methods, among them Cohnheim, the leading experimental pathologist of Europe, who told his assistants: "Drop everything and go at once to Koch. This man has made a splendid discovery which is all the more astonishing because Koch has had no scientific connections and has worked entirely on his own initiative and has produced something absolutely complete. There is nothing more to be done. I consider this the greatest discovery in the field of bacteriology and believe Koch will again astonish and shame us with still further discoveries."

One malady, above all, interested Koch throughout his life. Again and again he returned to the problem of tuberculosis. Tuberculin is looked upon as the one folly of a great scientist. As a therapeutic agent, tuberculin has failed to fulfill the expectations which Koch prematurely raised, but as a diagnostic aid it has proved of great value.

Emil Behring (1854-1917) was a pupil of Koch and later his fellow-worker. The success of his serum treatment of diphtheria was amazing. Wherever the use of Behring's antitoxin was tried, there was an immediate and notable decline in mortality.

Jakob Henle (1809-1885), a rabbi's grandson and a pupil of Müller at Bonn, was the greatest anatomist of the nineteenth century. He later removed to Berlin with Müller.

Becoming suspect to the authorities as a member of the Burschenschaft, he was prosecuted, and was sentenced to six years' detention in a fortress, but was amnestied, and in 1840 went to Zurich as professor of anatomy.

"The life of Henle was a drama. None familiar with his career can forget his disastrous love-affair in boyhood, celebrated in a cycle of songs dedicated to the flames, but which nevertheless survived; his duels, in one of which he was successful, only to pierce his foot when he put down his rapier in triumph; his attempt to fling away his bachelorhood in three cities, including a proposal to Felix Mendelssohn's sister, who was already secretly betrothed; his romantic marriage to Elise Egloff, the beautiful nurse-maid, who was really the illegitimate daughter of a well-to-do Swiss."

Henle did a great many pathological studies but primarily he was an anatomist. He was the discoverer of epithelium, was the founder of histology, the science of the minute structure of the tissues.

Rene Theophile Hyacinthe Laennec (1781-1826), took his degree in Paris in 1804, filled many important posts, and belonged to the faculty of the College de France. He was a distinguished anatomist, a great clinician, and developed auscultation.

The Hippocratists had long ago pointed out that certain sick people had strange noises going on in their chests. "It bubbles like boiling vinegar," and "It creaks like a new leather strap," they had said. Still, little use could be made of these perfectly accurate observations until doctors began to think anatomically.

"Laennec had under his care an exceedingly stout woman suffering from heart disease. Listen as he might, he could not hear the heart-sounds clearly. On his way to visit this patient, Laennec was passing through the courtyard of the Louvre. A heap of old timber was lying in one corner, and some children were playing there. They had discovered a new game. One of the pieces of wood was a long beam. A youngster had his ear at one end of it, and another was signalling by tapping the other end. This gave Laennec an idea. He quickened his steps, and, when he reached his patient asked for a quire of letter-paper. Having rolled this paper into a cylinder, he applied one end of it to the site of the cardiac impulse and listened at the other end. The result was marvelous. He could hear the heart-sounds much better, much more plainly, than with his ear on the chest. Moving his paper cylinder from place to place, he listened to the sounds that were forthcoming all over the heart. Then he listened to the breath-sounds. They were so loud that they startled him. The stethoscope had been discovered, the auditory tube which was to become symbolical of latter-day physicians as the urine-glass was of the medieval doctor. Indirect auscultation had replaced the direct method. A new process of physical examination had been revealed, a new means of access to the interior of the organism."

Like Auenbrugger, Laennec had musical gifts. He was an instrumentalist as well as an amateur, being, we are told, an excellent performer on the flute.

Joseph Lister (1827-1912) sprang from a Quaker family. His father was a wine-merchant, but also a man well versed in mathematics and physics, and one who devoted his leisure to microscopical studies. Having qualified in London, young Lister went to Scotland, where in 1854 he became Syme's house-surgeon at the Edinburgh Hospital. After distinguishing himself by various anatomical, physiological, and pathological researches, he was in 1861 appointed professor of surgery in Glasgow. It was there that his decisive life-work began.

It has been said that there are only two periods in the history of surgery—before Lister and after Lister. The general belief was that contused wounds necessarily suppurated. In 1867 he showed that infection in wounds could be prevented by antiseptics and by cleanliness.

William Osler (1849-1919), a Canadian of Celtic stock, the son of a minister of religion, was originally intended to adopt his father's profession. Having early begun to take an interest in natural science, he soon abandoned the idea of becoming a clergyman, and devoted himself to medicine. He studied the elements at the McGill University in Montreal, and took his degree there in 1872. Then he went abroad for post-graduate work.

Returning to Canada in 1874, Osler soon became professor of medical institutions at McGill University. In 1884, he accepted a summons to become professor of clinical medicine in the University of Pennsylvania. Five years

later, he removed to Baltimore, and began clinical work at Johns Hopkins Hospital.

In 1905, Osler left Baltimore. He was suffering from over-work, and therefore accepted a call to Oxford as professor of medicine—the highest distinction open to a British physician. But though he was absent in the flesh, in the spirit he remained active in America.

At Oxford, his hospitable home was always open to American doctors. A heavy blow befell him in 1917 when his only son was killed at Ypres. Two years later, when William Osler was hard upon seventy, he also passed away. His library was sent back to America, to the McGill University in Montreal, where he had taken his medical degree.

Louis Pasteur (1822-1895) was a chemist, not a physician. However, he did far more for the prevention of illness, did far more in this respect on behalf of human welfare in general, than many "great doctors" who lived before and after him. Few men of science have become so widely known as he.

Pasteur was a Burgundian. Born at Dole in the year 1822, the son of a tanner, he was destined for the scholastic profession. Having been sent to Paris to study, he showed from the outset noteworthy scientific talent. After spending several years engaged in teaching activities at Dijon and Strasburg, Pasteur removed to Lille as dean of the newly founded faculty of natural science there.

Coming as he did from a wine-growing district, Pasteur had often heard his compatriots complain that wine so readily "fell sick," just like living creatures. They did not know how to explain the process, and were therefore unable to ward it off and to avoid the losses it entailed. Now Pasteur's studies on fermentation showed him how wine was spoiled.

In the year 1865 the silk-growing industry of southern France was faced by a catastrophe. Everywhere the caterpillars were dying. Whole districts were being impoverished. Pasteur was sent for to study the malady. He had never before had a silkworm in his hand. He went to the region, examined the question without prejudice, made experiments, and, after a few years, having had to cope with immense difficulties, he was able to elucidate the nature of the disease, to ascertain the method of infection, and to indicate a way of breeding healthy stock. The French silk industry was saved.

Pasteur's discoveries had benefited the wine industry, the silk industry and the animal and fowl industries, but his work was not yet complete, for he had before him the problems of applying his principles to the control of human diseases. For this effort he chose to study rabies, or hydrophobia.

Pasteur's first human patient was Joseph Meister, an Alsatian boy nine years of age. He had been bitten in fourteen places by a rabid dog. Pasteur hesitated to apply his immunizing vaccine for fear it would harm the boy, but finally he was persuaded to do so, since otherwise it was inevitable that the boy would die of rabies. Pasteur administered the new prophylaxis and rabies did not develop. Soon afterward a second case was brought to him. A shepherd boy of fourteen, named Berger Gupille, had struggled with a rabid dog to prevent it from biting some younger boys. He had himself been bitten. The vaccine of Pasteur saved him from rabies. In the yard of the Pasteur

Institute at Paris there is a statue of this shepherd boy showing him struggling with the rabid dog.

After these two successful cases people who had been bitten by rabid dogs came from all over Europe to receive the vaccine. The first Americans to receive treatment were four children from Newark, New Jersey. They were sent to Paris and treated there in December, 1885, six months after Pasteur had treated Joseph Meister. The following year a supply of the virus was sent to America.

Pasteur's and Koch's work resulted in the founding of bacteriology.

Max Pettenkofer (1818-1901) founded the science of experimental hygiene. He had not originally intended to devote himself to public health, having reached it by a circuitous route. The son of a peasant, he was destined by the family to become an apothecary, like his uncle. For a time he was refractory, and went on the stage. Then he resumed his studies, becoming in 1843 a qualified apothecary, and at the same time taking his degree as doctor of medicine.

At the age of eighty-three, Pettenkofer, his health being broken, sought a voluntary death. His work was left as his monument. Hygiene had taken an outstanding place in the system of medicine. Since then it has continued to develop, achieving new conquests year by year. To it belongs the future.

Rudolf Virchow (1821-1902), born at Schievelbein in Pomerania, a son of the town treasurer, went to Berlin in 1839 to become a pupil of the army medical school. Johannes Müller and Schonlein were his principal teachers. He took his degree in 1843.

For almost half a century, extending from 1856 to his death in 1902, Virchow lived in Berlin as professor of pathological anatomy and director of the Pathological Institute—the first independent institute of the kind. He had founded a school; he reigned as pope of German medicine, supreme though not without adversaries. Throughout this epoch, his researches were mainly concerned with anthropology.

Virchow was the founder of modern pathology, went a step further and opened up the new field of cellular pathology. There was practically no field of pathology that Virchow did not enrich.

Carl August Wunderlich (1815-1877) was the son of a physician. His mother belonged to a family of French refugees. Born at Sulz on the Neckar, he attended the high school in Stuttgart, and subsequently, from 1833 onwards, studied at the University of Tübingen.

Wunderlich did not discover the use of the clinical thermometer. We have already seen how, long ago, Santorio, with a primitive instrument, made measurements of bodily temperature. But it was Wunderlich who taught us to read and to understand the curves of fever.

Wilhelm Conrad Roentgen of Würzburg, a man of fifty years of age, was working in his darkened laboratory on November 8, 1895. He was experimenting with the so-called cathode rays. When he noticed an unusual phenomenon, he began a thorough and patient investigation of it. In less than two months he was sufficiently certain of the results he had obtained to present a paper on "A New Kind of Ray" to the Physical Medical Society of Würzburg.

He admitted that he still did not know much about the nature of the rays, and therefore referred to them as X-rays.

Roentgen was a famous physicist before he ever discovered X-rays, but the discovery was of such general interest that his name became a household word within the space of weeks. Morality brigades were formed overnight to resist to the death the destruction of all decency and privacy. A London firm rose to the occasion, and made a small fortune from the sale of X-ray-proof underwear. New York was also in the van, with a determined attempt to obtain legislation against "the use of X-rays in opera-glasses in theatres." Slowly—and with some disappointment—the general public realized that an X-ray picture was not pornographic nor ever likely to be.

Roentgen was awarded a Nobel prize in 1901. The introduction of anesthesia and of X-rays are two great discoveries which have contributed to progress in the field of surgery and medicine.

Ephriam McDowell (1771-1830) was born in Rockbridge County, Virginia, and came of that sturdy Scotch Presbyterian stock which has done so well by this land of ours. His father was Samuel McDowell, an important man in his place, lawyer, judge, and legislator. In 1755 he married a Miss McClung, also Scotch and Virginian. To them were born twelve children, of whom Ephraim was the ninth.

American surgery during the earliest pre-Listerian and pre-anesthetic days became famous through the work of Ephraim McDowell (1771-1830) who after studying in Edinburg, settled in the backwoods village of Danville, Kentucky, where he performed the first ovariectomy in 1809, when thirty-eight years old and fourteen years in practice. It had never been done before. For centuries surgeons had regarded it as impossible, but out of the American wilderness came the pioneer to show the way.

Jane Todd Crawford was enormously distended; although beyond term, she thought she was in labor, and two physicians requested McDowell's aid in delivering her. Upon vaginal examination, McDowell found the womb empty, and thus realized that the enlarged abdomen was not due to a fetus but to an ovarian tumor. McDowell explained that never had he seen so large a substance extracted, nor heard of an attempt; he informed her that the situation was dangerous, and the experiment uncertain, but he promised to perform it if she would come to his home in Danville.

Mrs. Crawford lived sixty miles away; mounting a horse, resting her tumor on the horn of the saddle, she arrived after a journey of a few days in McDowell's village. Without trained assistants, anesthetics or a precedent, McDowell placed her on a table and operated. "In five days I visited her, and much to my astonishment found her engaged in making up her bed. I gave her particular caution for the future; and in twenty-five days, she returned home as she came, in good health, which she continues to enjoy."

Jane Todd Crawford reached the age of seventy-eight, outliving for several years the man whom she made the "Father of Ovariectomy."

James Marion Sims (1813-1883), a young doctor in South Carolina, in 1835 tore the tin sign from his office-door, and dropped it in an abandoned well. His practice had consisted of two patients, both babies, and both had died. He settled in Alabama. So little did he know himself that ten years later he

said: "If there is anything I hate, it is investigating the organs of the female pelvis." He invariably informed gynecological cases, "This is out of my line."

Entirely against his will, cases of vesico-vaginal fistula were sent to him. He refused to attend these young colored mothers, saying over and over again that nothing could be done for them. Later, he built a little hospital for six of these slave-girls, and kept them for four years at his own expense. He found that when he placed a woman in the knee-chest position, the admission of air expanded the vagina. With a pewter spoon he originated the duckbill vaginal speculum: "Introducing the bent angle of the spoon I saw everything, as no man had ever seen it before." Walking from his house to the office, he picked up in his yard a piece of brass wire that was used in suspenders before the days of India rubber; this fine brass wire gave him the idea for his silver-wire suture. "From an onrush of air, a bent spoon and a torn suspender, Marion Sims learned how to revolutionize gynecology."

On account of ill health he decided to change his location. "I was always a little better in New York and Philadelphia than in any other place." In 1853 he left his Alabama home and settled in New York. After some preliminary skirmishes with the foremost physicians, Sims organized the Woman's Hospital. Long afterward he wrote: "The Woman's Hospital from the day it was opened had no friends among the leaders—among hospital men. I was called a quack and a humbug, and the hospital pronounced a fraud." The sweet-tempered Sims was unusually bitter about his early New York experiences; in time, he dominated the gynecological practice of the metropolis.

At the age of forty-eight, Sims arrived in Paris in 1861. The most hopeless cases were brought to him and his successes were marvelous. It was customary for Americans to come to Europe to study, but few had come to teach. Sims was urged to settle in London; he was decorated by the governments of France, Portugal, Spain, Belgium and Italy. No American breast had ever been covered with so many ribbons.

Sims translated himself from the status of a more or less obscure Southern country practitioner into a world figure, and is regarded as one of the founders of modern gynecology.

Walter Reed (1851-1902) was a United States army doctor holding the title of major.

Yellow fever had for generations been the greatest scourge of tropical America. Typhoid and smallpox were easily controlled because the means of preventing them were known; but yellow fever was still a mystery. In the year 1900, a special commission of army doctors was sent to Havana to study the problem. Its chairman was Walter Reed, and his associates were James Carroll, Jesse W. Lazear and Aristides Agramonte. They had good reason to suspect that the disease might be carried by mosquitoes.

The difficulty, however, was that the lower animals were not then known to suffer from yellow fever, and experiments had to be made with human beings. The commission decided that a solution of the yellow fever mystery, and all that this would mean in the saving of life, would justify experimenting on human beings. The members of the commission agreed that it was their duty to be the first ones to run these risks.

The first successful experiment was made with Dr. Carroll, who allowed

himself to be bitten by a mosquito which had previously bitten four yellow fever patients. For three days his life hung in the balance. He finally recovered, but Lazear, the second man to be bitten, died.

An experiment station called "Camp Lazear" in honor of the first martyred member of the party, was established in the open country near Havana. Volunteers were called for; and, in spite of the danger, there were always men ready and willing to serve in this cause. The first two volunteers after Lazear's death were a private, John R. Kissinger, and a civilian government clerk, John J. Moran. Reed explained to them fully the danger and suffering involved. Then, seeing they were determined, he stated that a definite money compensation would be made them. Both young men declined to accept it, making it, indeed, their sole stipulation that they should receive no pecuniary reward, whereupon Major Reed touched his cap, saying respectfully, "Gentlemen, I salute you." Reed's own words, in his published account of the experiment on Kissinger and Moran, are: "In my opinion, this exhibition of moral courage has never been surpassed in the annals of the Army of the United States." Both Kissinger and Moran had severe attacks of yellow fever after submitting to the bites of infected mosquitoes. Fortunately, they recovered, as did all the men who developed yellow fever later as a result of the experiments at Camp Lazear.

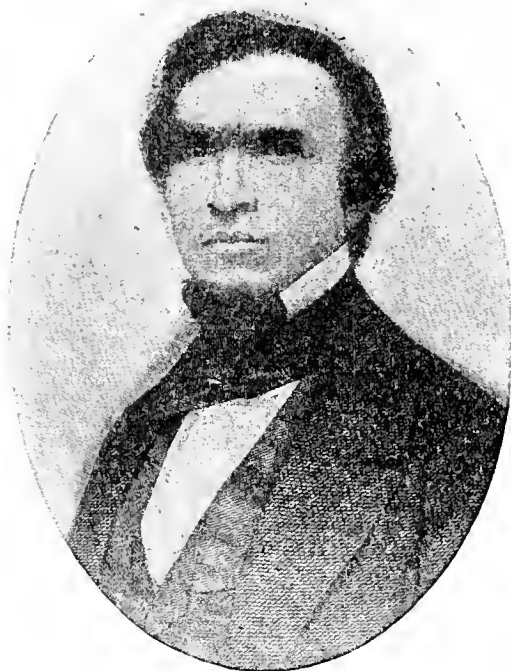
In 1900 Reed wrote his wife ten minutes before the close of the year in which this discovery was made, he said: "I thank God that this has been accomplished during the later days of the old century. May its cure be wrought out in the early days of the new."

Alexander James Porter, a Scotch-Irish Presbyterian, arrived in America from Ireland in 1793. His brother James was a distinguished Presbyterian preacher in Ireland, where his frankness cost him his life by court martial procedure in the Irish troubles of 1798. He was hanged in front of the church in which he had preached the offending sermon.

In 1796 Alexander James Porter set out on horseback from Delaware to Nashville, Tennessee, to establish a wholesale linen business, mostly Irish linens. It was a long and arduous trip, to add to the vicissitudes of which he developed typhoid fever en route. And thereby hangs a tale, a tale portraying vividly the sturdiness, the sympathy, and the romance of pioneer life. He didn't know he had typhoid. He thought he was just tired. He came presently to a home and asked for water. A girl took a bucket and ran to the spring. He was weaker than he thought and when she came with the water he lay on the ground in a faint, his horse nibbling at roadside grass. The girl was Susan Massengill. They bore the young stranger into the house. He lay ill for five weeks. Then for two weeks he gathered his strength for the remainder of the trip to Nashville. When he left the Massengill home, Nashville bound, he did not go alone, for that day he and Susan Massengill had married.

The third child of this union was Robert Massengill Porter who entered the University of Nashville in 1832 and was awarded a Bachelor of Arts degree in 1836.

Dr. Porter continued his studies and graduated in law at Harvard in 1838. He returned to Nashville and married Mary Wharton Williams, a daughter of one of the city's most renowned pioneers. Mrs. Porter survived that mar-



DR. ROBERT MASSENGILL PORTER (1818-1856)
OF THE MEDICAL DEPARTMENT OF THE
UNIVERSITY OF NASHVILLE

riage by three months. "His hopes of domestic happiness being thus rudely interrupted, he was inclined to seek retirement from the world." In June, 1840, he matriculated in the Theological Department of Princeton, and was graduated in 1843. He never preached.

In the fall he entered the University of Pennsylvania to study medicine and was graduated in the class of 1845. And so he came late to the choice his father had made for him early. He arrived in Paris, May 24, 1845, for a graduate course in anatomy. After finishing his course in Paris, he visited hospitals in Italy, Germany, England, Ireland, and Scotland. In 1848 he returned to Nashville and began the practice of medicine and was soon offered the chair of anatomy and physiology in the medical department of the University of Nashville. He threw all of his training, all of his character, and all of his engaging personality into the development of the university's new department, making it the largest medical college in the South, the third largest in the nation, acknowledging only the superiority of the University of Pennsylvania.

In 1852 he married Mrs. Felicia Grundy Eakin, a woman of great culture, the youngest child of Felix Grundy, lawyer of distinction, a United States senator, and a member of President Van Buren's cabinet.

The dissecting room of a college of medicine today is a vast improvement over one in 1856. How much of our improvement has risen out of tragic ashes! Men have died that other men might learn not to die. Martyrdom is not an infrequent phase of progress. On May 27, 1856, Dr. Porter took a cadaver,

newly secured by the college, and made it the subject of an anatomical demonstration during a period of two hours. A peculiar infection developed within twenty-four hours, mild at first, then gathering in gravity.

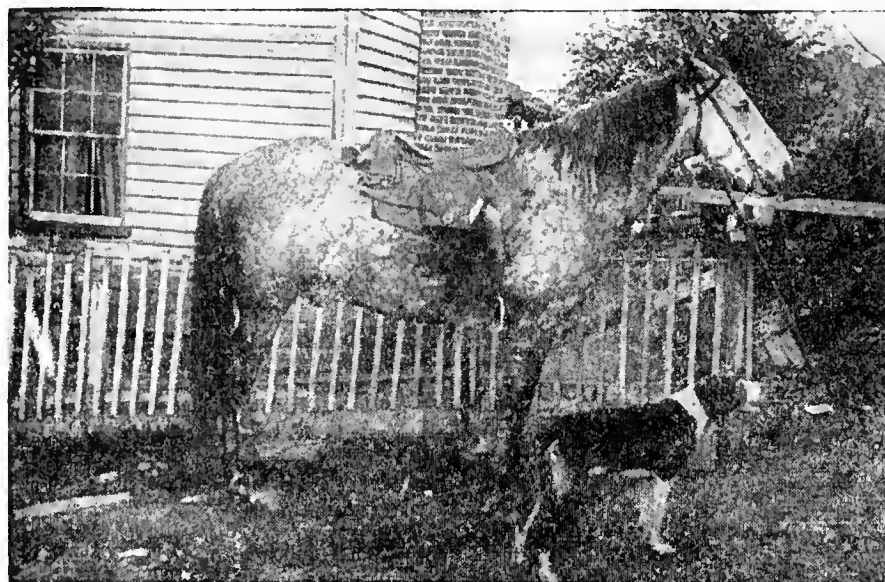
Robert Massengill Porter died of blood-poisoning. His death caused much comment in the country's dissecting room circles and, more than comment, much preventive effort. Such tragedies are not heard of today. And so Robert Massengill Porter served by dying. But at the age of 38 he met death too young.

The esteem in which he was held is attested by the fact that when he died there were standing at his bed-side his own Presbyterian pastor, a Catholic priest, and a Jewish rabbi. The largest crowd that had ever assembled at a funeral in Nashville followed his remains to Mt. Olivet cemetery.



DR. JOHN DAVID MASSENGILL (1844-1919)

John David Massengill, father of Samuel Evans Massengill, at the age of 16 years volunteered as a soldier in the Confederate States Army and rode four years under those great cavalry leaders, Generals Forrest and Wheeler. After the close of the war he took up the broken thread of his education and life and began the study of medicine. In 1874 he received his degree of M. D. from the Baltimore College of Physicians and Surgeons. He began practice during the days of Reconstruction in the South, and on account of the poverty of that period his practice was largely charitable, and remained so during his entire life. During the early years of his practice it was the custom for the country doctors to extract teeth. S. E. Massengill's first connection with medicine was holding the heads of patients who came to have their teeth extracted.



ONE OF DR. JOHN D. MASSENGILL'S SADDLE HORSES, EQUIPPED WITH THE SADDLE-BAGS AND SLICKER THAT WERE GENERALLY USED BY COUNTRY DOCTORS BEFORE THE ERA OF GOOD ROADS

Dr. Massengill, as was generally the case during his period, was also a farmer. He was a great lover of the chase and always kept a pack of fine fox hounds. Also, he was enthusiastic about fine horses and brought much of the best blood of Kentucky to his section. At one fair his trotters, pacers and show horses took seventeen first premiums.

Senor Manuel Garcia, who created the laryngoscope, was a singing-master who wanted to see how his larynx worked. The idea came to him out of a very blue sky. With two mirrors it is possible to see round a corner, and the larynx is so far round a corner as to be normally invisible. Garcia bought his two mirrors, a little dental mirror with a long handle, which cost 6 francs, and a hand mirror. The dental mirror he placed firmly against his uvula, and what appeared there he saw in the hand mirror, which reflected a ray of light on to the dental mirror.

By the time Garcia died in 1906, at the ripe age of 102, a distinct department of the surgical art had been firmly based upon the laryngoscope he invented. Again, we find a valuable discovery made in medicine by some one outside the profession.

Holmes says: "Medicine appropriates everything from every source that can be of the slightest use to anybody who is ailing in any way, or likely to be ailing from any cause. It learned from a monk how to use antimony, from

a Jesuit how to cure ague, from a friar how to cut for stone, from a soldier how to treat gout, from a sailor how to keep off scurvy, from a postmaster how to sound the Eustachian tube, from a dairy maid how to prevent smallpox, and from an old market woman how to catch the itch insect. It borrowed acupuncture and the moxa from the Japanese heathen, and was taught the use of lobelia by the American savage."

Diphtheria antitoxin was placed in the hands of the medical profession in 1895, and in its dying years the nineteenth century bequeathed to the twentieth three important discoveries, the X-Ray by Wilhelm Konrad Roentgen, the Finsen lamp by Niels Finsen, which gave us phototherapy, and radium by Pierre and Marie Currie.

The perspective is not sufficient to fully evaluate the accomplishments of the twentieth century. The following are some of the outstanding ones:

The discovery of insulin, the anti-diabetic hormone, discovered at the University of Toronto in 1922 by Dr. F. G. Banting.

The great advance in parenteral therapy, especially the use of arsenical preparations for the treatment of syphilis.

The development of the glandular products that have become popular in the treatment of disease.

The knowledge gained of anaphylaxis.

The use of preventive medicine and the reduction of mortality as a result of the growing control of the infectious and contagious diseases and the development of hygiene and sanitation.

The most important dietetic discovery of the twentieth century is that with regard to the vitamins.

A few of the outstanding doctors of the nineteenth and twentieth centuries, not heretofore mentioned, are: Austin Flint, Joseph O'Dwyer, Lawson Tait, Thomas Addis Emmet, Howard A. Kelly, John B. Murphy, Victor Horsley, S. Weir Mitchell and the Mayo brothers.

During the latter part of the nineteenth century and the twentieth century the large scale manufacture of elegant pharmaceutical products was developed into a large industry.

ANESTHESIA

The greatest triumph achieved in any department of medicine, and worthy, perhaps, to be described as almost, if not quite, the most beneficent discovery in the world's history, is that of the successful employment of anesthetics. This great glory belongs to the nineteenth century—Ether, 1842; nitrous oxide, 1844; chloroform, 1847.

From the dawn of civilization attempts had been made to control or at least deaden pain. Incantations were used for a thousand years to render patients less conscious of the pain of an operation, and deities were invoked on their behalf. For another thousand years the victim was tied down with ropes and instructed to commend himself to God and bear his sufferings beneath the surgeon's knife with such fortitude as he could command.

The deep sleep of Adam was anesthesia. Vinegar and hyssop were probably given to Christ for this purpose.

The deadening of pain by soporific potions was known even to some primitive peoples as well as those of the earliest civilizations. Helen cast "nepen-the" into the wine of Ulysses, and the Talmud of the Jews speaks of a narcotic called "samme de shinta;" there is the "bhang" of the Arabian Nights and the "drowsy syrups" of Shakespeare's time. Opium and Indian hemp, "hashish," were probably known to the Egyptians and Greeks, and the mandrake to the Babylonians and Hebrews. This mandrake is the European plant, not the May apple, or mandrake, of America.

Mandrake was the most popular substitute for an anesthetic during the Middle Ages. It held its vogue up to the sixteenth century. It was an inefficient anesthetic and ceased to be employed.

In the teachings of the school at Salerno were revived the "surgical sleeping draughts" mentioned by the Church fathers Hilary and Origen, and previously referred to under the name of the "soporific sponge." One of these was composed of opium, henbane, mulberry juice, lettuce, hemlock, mandragora, conium and ivy. This was inhaled from a sponge by the patient, who was later revived by fennel juice applied to the nostrils. The plants were dried in the sun, dipped in warm water when required and applied to the patients' nostrils. A recent experimenter has found that these medieval narcotics "do not make even a guinea pig nod."

Crawford W. Long, M. D., discovered the use of sulphuric ether as an anesthetic in surgery on March 30, 1842, at Jefferson, Jackson County, Georgia. Dr. Long was born at Danielsville, Georgia, Nov. 1, 1815, and died at Athens, Georgia, June 16, 1878.

He attended the academy in his native town, and at the age of 14 entered Franklin College, now the University of Georgia, where he took the degree of master of arts, in 1835, at the age of 19, being considered "studious and wise" beyond his years, and called "The Baby" at college on account of his youth. He stood second in the graduating class.

He took a one-year course at Lexington, Kentucky, and in 1837 he entered the medical department of the University of Pennsylvania, where he received the degree of M. D. in 1839. After his graduation he went to New York and spent eighteen months with leading teachers. Specializing in surgery, he was impressed by the terrific suffering as a result.

At twenty-six he returned to Jefferson, Jackson County, Georgia, and began the practice of medicine. Later, he practiced in Atlanta for a year and, finally, located at Athens, Georgia, where he resided till his death, after practicing medicine for nearly forty years.

Long made the discovery of surgical anesthesia because he was looking for it, and because he was a keen observer and a courageous man. His experience in the New York hospitals, where he witnessed the pain of women in childbirth, convinced him of the need of an anesthetic agent, and he determined to find one if possible.

Dr. Long was the first man known to have used an anesthetic. In 1842 he gave ether to a patient and performed an operation on him. The bill for that operation still exists—\$2 for the operation and 25 cents for the ether. Dr. Long placed his patient, a certain Mr. James Venables, profoundly under the influ-



DR. CRAWFORD W. LONG (1815-1878)

Here is shown the statue of Dr. Crawford W. Long in the Hall of Fame under the dome of the National Capitol in Washington. This honor is in recognition of Long's great discovery of the use of sulphuric ether as an anesthetic. Also of unusual interest is the fact that Georgia's other representative in the Hall of Fame is Alexander H. Stephens, Vice-President of the Confederate States of America, a classmate and roommate of Dr. Long at the University of Georgia.

ence of ether and removed a tumor from his neck painlessly. During the next twelve months, Long successfully repeated the use of ether several times.

The use of anesthetics to alleviate the pain of surgical operations and of childbirth was unknown before the discovery of Dr. Long. No greater boon has ever come to mankind than the power thus granted to induce a temporary but complete insensibility to pain.

It has been said that Dr. Long was in many respects in advance of his day. He treated and cured consumption by food and fresh air, and he treated typhoid fever practically as we do now. He operated several times very successfully for cancer of the breast, always clearing the ribs and removing the auxiliary glands. He cured several cases of lockjaw, and was especially skilled in the use of obstetrical forceps.

Those who knew Dr. Long declared him a man of exceptional qualities of mind and soul. Dignified in manner, his whole appearance betokened culture and high character. It is said he possessed no eccentricities, very unusual in a celebrity. He was sensitive, refined, and considerate of others; free from envy, malice, and uncharitableness. He maintained a slight reserve, except among intimates and congenial people. Cheerful in the sick room, he inspired his patients with confidence. He was fond of Shakespeare and good music; tall and slender, dressed in conventional black, always with frock coat; in short, a high-bred, scholarly Christian gentleman.

"My profession is to me a ministry from God."

Two years later, in 1844, Horace Wells, a dentist of Hartford, Connecticut, began to experiment with nitrous oxide, the anesthetic properties of which had been suggested by Sir Humphrey Davy in 1799. During the experiments, the sudden death of one of Wells' patients so upset him that he withdrew from practice, and four years later committed suicide.

William Thomas Green Morton of Massachusetts had been a partner of Wells and was naturally interested in the subject of anesthesia. On taking up the study of medicine, Morton came under the preceptorship of the chemist, Professor Charles T. Jackson of the Harvard Medical School. Jackson suggested to his pupil the possibilities of ether as an anesthetic. Morton began intensively to study the question with the result that on October 16, 1846, he administered ether successfully to a patient. Morton, maintaining secrecy as to its identity, tried to patent the new drug under the name of "letheon," had a quarrel with Jackson regarding their respective legal rights, but finally in 1847 published a paper announcing the new agent as sulphuric ether. Morton died of an apoplexy in 1868.

Wells claimed to be the sole discoverer of the principle of anesthesia; his mind unhinged by failing where Morton succeeded, he was caught throwing vitriol at the Broadway prostitutes, and committed to prison; Jackson insisted that he had told Morton everything, and he wrote to Humboldt of America's ingratitude; Morton quarreled over his patent-rights, and said he would sue every physician who used ether without his permission.

The other general volatile anesthetic, chloroform, was discovered independently in 1831 by the American Dr. Samuel Guthrie of Sacketts Harbor, New York, and the Frenchman Eugene Soubeiran. It was introduced as an anesthetic by Sir James Young Simpson of Edinburgh in 1847. His striking person-

ality, dominating character and unquestioned fame served him in good stead in his stubborn fight to make a place for chloroform, as an aid to childbirth. Rigidly Presbyterian Scotland was inclined to construe the pains of labor as presented by the Holy Writ, and anything aimed at lessening them, as heretical, contravening the precept, "In sorrow shalt thou bring forth children."

Dr. Simpson bore the brunt of the opposition to the use of anesthesia. He weathered the storm of that opposition, and what is still more unusual, he lived to see the general acceptance of the cause he championed.

While Simpson was waging his battles in Edinburgh, a less picturesque struggle was going on in America. Dr. Channing of Boston was the champion of anesthesia in this country. The opposition he encountered was not based on a religious ground, but on one which would seem totally absurd and ridiculous if it were not for the fact that the same argument was raised again as late as 1921. The argument against ether for mothers was the sophistry that the suffering involved is one of the strongest elements in the love which the mother bears for her child. As one clergyman expressed it, "chloroform is a decoy of Satan, apparently offering itself to bless women; but in the end it will harden society and rob God of the deep, earnest cries which arise in time of trouble for help."

In the middle of April, 1853, an event occurred which exerted a greater influence on popular acceptance of anesthesia at childbirth, not only in Great Britain, but in America as well, than all the efforts of Simpson. Queen Victoria accepted chloroform for the delivery of her seventh child, Prince Leopold. Again in 1857 the Queen accepted chloroform for her confinement. Formal opposition ceased in Great Britain thereafter, and to a large extent in America also.

So surgical anesthesia became a demonstrated reality. Anesthesia? That word wasn't even known then, for the condition was new and there were no words in the language to describe it. The men concerned turned to our great physician and scholar and author, Oliver Wendell Holmes, and asked him for a name, and he gave us anesthesia, anesthetic, and anesthetist.

SURGEONS AND SURGERY

CHAPTER XII

It appears that surgery was born of demonology. By far the most important phase of prehistoric surgery was the operation known as trepanation—the removal of part of the skull vault. The chief indications for trepanation were infantile convulsions, relief of cerebral tension, cranial injuries, headaches, epilepsy and blindness. The object of the perforation was to give the confined demon an opportunity to escape.

Some Stone Age skulls show that this painful operation had been performed five or six times on the same patient. The prevalence of that operation is shown by the fact that the bones of one hundred and twenty persons found in a mound in France yielded forty trephined skulls. This would seem to indicate that thirty-three per cent of the people in that locality had undergone the operation.

The following gives an account of a substitute for trephining that occurred in the thirteenth century:

"Albert of Hapsburg was a hard, cold man, with all of his father's will and energy, yet without his moderation and shrewdness. He was haughty and repellent in his manner, and from first to last made no friends. He was one-eyed, on account of a singular cure which had been practiced upon him. Having become very ill, his physicians suspected that he was poisoned; they thereupon hung him up by the heels and took one eye out of its socket, so that the poison might thus escape from his head."

It was Elliott Smith who showed that the operation of circumcision was practiced about 4000 B. C. He actually found a number of pictures of the operation which were carved at least 2,000 years before the time of Rameses II, and other evidence proving that it had been employed over a thousand years earlier. The first written record of the operation was made about 800 B. C. and is in the seventeenth chapter of Genesis.

Circumcision is the only operation the Bible mentions apart from Adam's rib excision.

The earliest known pictures of surgical operations are engraved on the stones over a tomb near Memphis, Egypt. These engravings were made 2,500 years before Christ; their age is more than twice that of the Christian era. The pictures show the operation of circumcision and operations on the legs and arms, and these operations, with the addition of castration, included all the surgical procedures performed by the Egyptians.

Ophthalmology is one of the oldest specialties. Hammurabi, laying down his code in 2250 B. C., legislated specifically for operations on the eye—ten shekels for a successful operation, amputation of both the surgeon's hands in the event of failure.

Accidents during sport must have been common, and that is why the surgery of fractures and dislocations was well developed in Hippocratic times, with the result that many a page of these early surgical treatises has a modern ring. Even major operations were performed, although with considerable hesitation. Scrupulous cleanliness was impressed upon the surgeon, and this provided, in some measure, for asepsis.

In the middle ages, under the influence of the church, the practice of surgery in Europe was relegated to barbers, bath-house keepers, sow-gelders, executioners, and any strolling vagabond who cared to try his hand at the art. Surgeons were looked upon as menials. Surgery was considered beneath the dignity of the physician, ecclesiastical opposition, strictly prohibited dissection and popular prejudices were antagonistic to all things medical. Surgery fell into the hands of the so-called "barber-surgeons" who matched their technic with the tempo of their time.

In England there were hospitals, there were physicians, and there were apothecaries. Surgeons had yet to appear, but the barbers, who understood what surgery there was, were quietly creating a guild to protect their own interests, a guild which was to have a considerable influence upon the rise of surgery in England.

The following shows the attitude toward surgeons during the middle ages:

Surgery was regarded an unfit occupation for a gentleman and scholar, and was largely relegated to barbers. "If possible, the surgeon should avoid a bad reputation, because the people, since ancient times, consider all surgeons to be thieves, man-killers, and the worst kind of frauds."

During the early part of the Middle Ages there were no trained surgeons in Europe. The only men with any medical education were the Jews; they studied in Arabia. Even as late as the eleventh century the armies had no surgeons. The pay of the English army surgeons was good; a first-class surgeon in the fifteenth century received two hundred dollars a year and twelve cents a day for expenses. The wage for a laboring-man at that time was about five dollars a year. The attitude toward men practicing surgery in the middle ages and Renaissance was such that the surgeons were continually in jeopardy of life.

Surgery was becoming more and more widely separated from medicine, and the belief that it was an inferior art was held almost everywhere. Debarred from university education and with their art regarded generally as more of a trade than a profession, surgeons in London, in Paris, and in a few other great centers banded together to protect themselves and their profession, and evolved an educational system of their own.

The first Act regulating the practice of surgery in England was passed in A. D. 1421. No woman was to practice.

In 1210 a guild of surgeons was instituted at Paris in which the members were divided into two classes. The "surgeons of the long robe" were the clerical barber-surgeons, who possessed some educational attainments. The "barbers of the short robe" were the lay barbers or surgeons. The word barber comes from *barbatonsorium*, or beard cutter. The lay barbers were later restricted to blood-letting and the treatment of ordinary wounds.

Formerly in England the patient, while undergoing venesection, was wont to grasp a pole in order to make the blood flow more freely, and as the pole was likely to be stained, it was painted red. When it was not in use, the barber would hang it up on the outside of his door, with white linen swathing-bands twisted round it. The red and white pole of the present day, so conspicuous in front of barber shops, has resulted by evolution from this custom. It is worthy

of note that, since the Revolution, a blue stripe is frequently added, making the patriotic combination of the "red, white, and blue."

Hippocrates had taught that in inflammatory disease, the patient should be bled freely from a vein near the site of the lesion and on the same side of the body—so-called revulsive bleeding. The later Greeks, and their followers the Arabians, taught that at the outset of inflammatory disease, the blood should be taken slowly, drop by drop, at a site far removed from the lesion, and on the opposite side of the body—so-called derivative bleeding. The Hippocratic method of revulsive bleeding had for centuries, been in disrepute as a most dangerous procedure, until Pierre Brissot (1478-1522) in the early sixteenth century, reintroduced it.

The barbers had been growing into an increasingly important civic body. A grant of arms in A. D. 1452 merely crowned their achievement of A. D. 1450, when the Mayor and Aldermen of London sanctioned a code of laws they had drawn up for the protection and government of their craft. In it they again insisted on their right to practice surgery.

From the point of view of numbers and in the superiority of their position and power, thanks to Edward IV's charter, the barbers had the advantage of the surgeons. But on the other hand the surgeons had a better social standing and much higher professional attainments.

In 1515, the surgeons were finally admitted as a department of the university, and the barber-surgeons were also admitted to the lectures on anatomy and surgery. From now on, surgery began to look up. In 1686 the royal surgeon Félix cured Louis XIV of fistula-in-ano, and was knighted as a reward. This incident marks the final step in the complete elevation of surgery. However, the barber-surgeon crudely plied his trade in England until 1745, when an act declared, "That the business of trade of a barber is foreign to and independent of the practice of surgery."

Guy de Chauliac, who lived in the fourteenth century, was the greatest authority on surgery in Europe at that time, and is called the Father of Modern Surgery. He accomplished the best of his work some five centuries before surgery in our modern sense of the term is supposed to have developed.

It is usually considered that he was born some time during the last decade of the thirteenth century, probably toward the end of it, and that he died about 1370. He was born Guido de Chauliac, the son of an Auvergne peasant. His early education must have been reasonably efficient, since it gave him a good working knowledge of Latin. He was educated in a little town of the south of France, made his medical studies at Montpellier, and then went to Italy, in order to make his post-graduate studies. Italy occupied the place in science at that time that Germany has taken during the nineteenth century.

Even his post-graduate experience in Italy did not satisfy Chauliac, however, for, after having studied several years with the most distinguished Italian teachers of anatomy and surgery, he spent some time in Paris.

One of Chauliac's most important contributions to major surgery was in rescuing the treatment of rupture from the hands of quacks. He described an operation for the radical cure of hernia, or rupture, and made it clear that the treatment of this condition should not be left to itinerant quacks and peddlers. His comprehensive text-book of surgery appeared about A. D. 1363.

A few of his criticisms evidence that his pen was as sharp as his scalpel: "There is a sect composed of military men, German chevaliers and others following the army, who with conjurations and potions, oil, wool, and cabbage leaves, dress all wounds, basing their practice on the maxim that God has given his virtue to herbs and to stones." "Another sect consists of women and of many fools who treat all diseases by referring them to the saints." After receiving John of Gaddesden's *Angelic Rose of Medicine*, Guy thus reviewed it: "They have sent me this insipid rose; I thought I might find some fragrance in it, but discovered only vapidness."

In the Introduction chapter of his *CHIRURGIA MAGNA* he said:

"The surgeon should be learned, skilled, ingenious, and of good morals. Be bold in things that are sure, cautious in dangers; avoid evil cures and practices; be gracious to the sick, obliging to his colleagues, wise in his predictions. Be chaste, sober, pitiful, and merciful; not covetous nor extortionate of money; but let the recompense be moderate, according to the work, the means of the sick, the character of the issue or event, and its dignity."

Roger Frugardi, a surgeon of school of Salerno, was one of the founders of modern surgery. He introduced the use of the seton, a method of stitching a bundle of linen threads through a fold of skin and leaving them to act as a counter-irritant. He was also the first to suggest that torn intestines, which had always presented difficulties to contemporary surgeons, might be sutured more easily over a hollow tube of elderwood. Roger ligatured blood-vessels which had been ruptured, if cauterization and styptics failed to check the bleeding; and, like Albucasis, he refractured and set again bones which had been broken and had united in bad position.

In the Middle Ages Roger and Roland and Jehan Yperman used ligatures, and so did many lesser surgeons. But despite the fact that ligatures were known, surgeons were never enthusiastic about undertaking the larger amputations. They had good reason for avoiding these operations. Whether ligatures were used or forgotten, the results of amputation were uniformly disastrous. This was simply because the battered stump of the limb was always smothered in scalding oil or roasted with a red-hot iron, or else favorite styptics of rabbit's fur and aloe and the like were applied.

It might have been thought at Paré's death in 1590 that his carefully recorded experiences and his undoubted authority would have ended for ever the controversy as to whether gunshot wounds were or were not poisoned. Actually, the debate continued.

Branca of Sicily, regarded as the first surgeon of the world, 1442, established a reputation of building up noses from the skin of the face.

Some other great surgeons of the Middle Ages were: Roland, a pupil of Roger; Bruno; Theodoric and his father, Hugo of Lucca; William of Salicet; Lanfranco; Henri de Mondeville; Yperman and John Ardern.

In 1308 a human body was publicly dissected for the first time in many hundreds of years in Venice. At first there was an outcry against the sacrilegious immorality of such a proceeding. In the course of years, however, the practice became accepted and remarkably elaborated.

Had it not been for the lawyers of Bologna demanding an autopsy in cases of suspicious deaths, pigs might have continued to be used for anatomical stud-

ies. Thus, dissection was brought to the cadaver! In 1315, Mundinus, University of Bologna, obtained two female cadavers which he dissected for his students.

Frankish surgery during the Middle Ages and later was an accepted barbarity. A Saracen surgeon relates the following experiences:

He had been shown first a man with an abscess of the leg. To this he applied poultices, and the patient seemed to be making satisfactory progress until a Frankish surgeon intervened. He denounced the poultices as useless and asked the man whether he would prefer to die with two legs or live with one. The patient said he would rather live. The Frankish surgeon assured him of the wisdom of his choice, and summoned a man-at-arms who bore a huge battle-axe. Calmly, the surgeon instructed the soldier to chop off the offending leg at one blow. The axe fell, but the leg was not completely severed. The surgeon directed his stalwart assistant to try again, higher up. At the second blow the patient died.

Up to 1616 the physicians and the Barber-Surgeons had been at peace, if not in amity. In that year, since the apothecaries had been created in a separate company, the College of Physicians approached James I and received from him a new charter. This conferred several new privileges, notably that of being able to take proceedings against anyone who administered "inward medicines" and was not a member of the College.

Surgery was advancing in every country in Europe. Almost to the end of the sixteenth century Ambroise Paré was the doyen of French surgeons. Germany had two surgeons at this time who rose far above the barbers who let blood, set broken bones, and treated almost everything.

Ambroise Paré, (1510-1590), a French military surgeon, was born in Brittany. He was not born a gentleman. He studied under a Paris barber and was such an apt student that he was taken in by the barber surgeons of the Hotel Dieu. He made the discovery that gunshot wounds are not poisonous. During his first campaign he followed the usual method of treatment—he poured scalding oil into the wounds. When the boiling oil gave out, the inexperienced surgeon could do nothing better than apply a simple dressing. He passed a most uneasy night, fully expecting that when he looked at his non-cauterized patients the next morning, they would be dead. He arose earlier than usual, and was astonished to find that those whom he had treated according to authority with the scorching oil were in great agony, suffering with severe inflammation at the edges of the wounds, while the others were quite comfortable, and had neither pain nor swelling. "See," says he, "how I learned to treat gunshot wounds; not by books."

This experience taught him to no longer place faith in the Hippocratic aphorism, "Diseases which are not cured by medicines are cured by iron; those which are not cured by iron are cured by fire; those not cured by fire are incurable."

The fact that he was allowed to preside at the deaths of three kings in succession, and still live, attests to Paré's sterling character and to his worth. It is even said that he was a Huguenot, and the only one spared by royal edict on the night of the great massacre.

At one time, Paré was obliged to defend himself against the whole faculty of the University of Paris because he taught that neither ground up mummies nor unicorn horns possessed therapeutic value. His modesty regarding his accomplishments in wound healing is refreshing. "I dressed him and God cured him," he said in explaining the cure of an important officer.

Paré, reviewing his life-work, wrote: "God is my witness, and men are not ignorant of it, that I have labored more than forty years to throw light on the art of surgery and to bring it to perfection. And in this labor I have striven so hard to obtain my end, that the ancients have naught wherein to excel us, save the discovery of first principles: and posterity will not be able to surpass us (be it said without malice or offense) save by some additions, such as are easily made to things already discovered."

One rather striking feature of the seventeenth century is the failure of practical medicine to react to the stimulating ferment of this period; and likewise the failure of surgery to progress despite the fact that the work of Paré seemed to promise an enthusiastic development of this specialty. As a matter of fact surgery had to wage a stubborn battle for recognition, and the fruit of battle was not won to a satisfying degree until much more than a century after Paré.

In Virginia in the seventeenth century the early records in regard to surgery are concerned chiefly with the treatment of wounds, burns, frostbite, fractures, dislocations and ulcers. The York County records show several surgeons at work. Dr. Haddon's treatment of an amputation was to give two cordials on the day of the operation and a purge four days later, with frequent ointments and external applications. After two months it became necessary to bleed the patient. Sores of the feet and legs are frequently mentioned and were probably due to the custom of going barefooted.

The seventeenth century was notable for improved instruments, yet the surgical achievements are indeed disappointing. The gulf between physician and surgeon was not yet bridged: the physician scorned to think surgically, and the surgeon feared to trespass on medicine.

During the seventeenth century, surgery was excluded from the curriculum at the University of Paris and witchcraft wrote a bloody chapter for the history of the world. Surgery was still not only questionable but exceedingly dangerous and advanced no further than Paré.

Richard Wiseman was the leading English surgeon of the period.

William Cheselden was the most outstanding figure in English surgery during the first half of the eighteenth century.

John Hunter (1728-1793) was the outstanding English surgeon of the eighteenth century. Modern surgery was founded by him.

Throughout the eighteenth century German surgery was a crime. A barber's apprentice, who sought to evade the humiliations inflicted upon him, was hunted like an escaped animal; the regimental surgeon was compelled to shave the army officers; the oculist, the bone-setter, the stone-cutter, the rupture-specialist, preyed upon the credulity of the people; the Prussian executioner, experienced in the disarticulation of joints and the breaking of bones, was granted permission to treat wounds and ulcers and to set fractures. Frederick the Great replied to the complaints of the Berlin surgeons: "If you are as skill-

ful as you pretend to be, every one will trust themselves to you rather than go to an executioner; but if you are ignoramuses, the public must not suffer, and rather than remain lame and crippled, let them go to the executioner."

The nineteenth century opened with surgery nearly as crude and barbarous and as limited in its scope as it had been in the earliest civilizations, and is now among the most primitive peoples. The nineteenth century closed with modern surgery well developed. In the early part of the nineteenth century, the distinction between surgeons and physicians was broken down and both were required to obtain the degree of doctor of medicine.

Medicine developed much more slowly than surgery, or, rather, lagged behind it, as it seems nearly always prone to do. Surgical problems are simple, and their solution belongs to a great extent to a handicraft. That is, after all, what chirurgy, the old form of our word surgery, means.

It has been said that there are only two periods in the history of surgery—before Lister and after Lister. Joseph Lister, later Lord Lister (1827-1912), made surgery safe for patients. A recital of the accomplishments of surgery, after the general acceptance of antiseptis, would appear to be out of place in a sketch of this nature.

WOMEN AND MEDICINE

CHAPTER XIII

WOMEN DOCTORS

The first woman doctor to receive historical notice is mentioned in the Ebers papyrus. She was the goddess Tefnut, and she compounded a medicine for the Great God Ra. It gave him a headache, but the goddess Isis cured this by another medicine which contained Berry-of-the-Poppy-Plant. This is one of the very early records of the use of opium to relieve pain.

Women have engaged in medicine as long as men. The practice of obstetrics in the early dawn days of the race was almost exclusively left to women. But when men became more advanced in medicine, they began to resent the competition of women and that resentment has continued. The history of the struggles of women doctors has therefore been a long recital of oppression. Yet in all ages there have been strong-minded women who have braved exclusion from the medical societies and schools and have ignored the adverse legislative enactments regarding their practice. There are numerous examples of Egyptian, Greek, and Roman women physicians who have won renown.

Among the women doctors of the Empiric School, the name of Cleopatra, Queen of Egypt, is widest known. Her early books dealt with cosmetics and perfumes, later books dealt with the diseases of women. These appear to have been such excellent books that some critics have doubted whether Cleopatra was the actual author, although during her lifetime that question was not raised.

Trotula, a woman, was a teacher at Salerno in the middle of the eleventh century. An interesting chapter in the history of the medical school at Salerno is to be found in the opportunities provided for the medical education of women and the surrender to them of a whole department in the medical school, that of Women's Diseases. After Trotula we have a number of women physicians of Salerno whose names have come down to us.

The organization of the department of women's diseases at Salerno, under the care of women professors, and the granting of licenses to women to practice medicine, is not so surprising in the light of this tradition among Greeks and Romans, taken up with some enthusiasm by the Christians.

Laura Bassi was professor of experimental physics at the University of Bologna which was founded in the twelfth century.

When it was announced that Miss Blackwell, the first American woman physician, had received the degree of M. D. at Geneva Medical College, a correspondent of the Boston Medical and Surgical Journal wrote as follows:

"It is to be regretted that she has been induced to depart from the appropriate sphere of her own sex, and led to aspire honors and duties, which, by the order of nature, and the common consent of the world, devolve alone upon men; and I am sorry that Geneva Medical College should be the first to commence the nefarious process of amalgamation."

Among the American Indians there were instances of unusual medical knowledge being attributed to old women. Under the primitive conditions

existing in the early years in Virginia, doctors' widows occasionally dispensed medical advice. As late as 1700 we find Mrs. Mary Seal, former wife of Dr. Power, winning a suit for four pounds seven shillings "for phisicall means, etc., by her administered in the time of Richard Dunbar's sickness."

Reverend John Clayton, writing to the Royal Society in 1688 of his observations in Virginia, reports that "A Gentlewoman, that was a notable female Doctress, told me, that a Neighbour being bit by a Rattlesnake swelled excessively; some Days afterwards she was sent for, who found him swelled beyond what she thought it had been possible for a skin to contain, and very thirsty. She gave him oriental Bezoar shaved, with a strong Decoction of the aforesaid Dittany, whereby she recovered the Person."

In Virginia the modern Trotula had to wait a long time for recognition. It was 1910 before woman physicians were admitted to membership in the Richmond Academy of Medicine.

DOCTORS' WIVES

The doctor's wife is really an important personage and a great auxiliary in the practice of medicine. The life of a prominent physician in active practice is unlike that of an ordinary business man. He is called upon at all times of the night and day to meet all manner of emergencies. Unless he is aided in his home, half of the effectiveness of his work will be lost.

How many people ever stop to consider the influence the doctor's wife must bear upon the doctor's character for good or evil—and how that influence must react upon the community which trusts its life into the doctor's keeping?

Every man is master of his home except the doctor. Day or night, at any hour, any one is free to ring his bell and ask for help. When the doctor is away, the rearranging of visits to patients, business schedules, consulting work, and innumerable other disordered events, all these duties often fall upon the doctor's wife. Upon her administrative and diplomatic abilities in these times her husband's success largely turns. She can make a practice successful or otherwise.

One author has written of the requirements of a successful physician's wife:

"Tact, discretion and a particularly large bump of curiosity are essential in a successful physician's wife. Her husband is sure to be deficient in powers of observation. He will often appear to be absent-minded. Her abnormally developed curiosity must be used to balance that defect. She must observe closely so as to be always well-informed, and her discretion must be used even in that. She must not know about the doctor's cases; but she must know much about his other experiences, if she is to be able to guide him wisely. Yet she must not ask him for information; but cause him voluntarily to impart it to her. She must gain his complete confidence without ever indicating that she wants it."

NURSES

Florence Nightingale did not found nursing, for nursing is one of the oldest occupations of women. What Florence Nightingale did was to make nursing a dignified profession and a branch of medicine. She instituted also the modern methods of training nurses.

Florence Nightingale was born in 1820, the daughter of a well-to-do country gentleman. She grew up to be an intelligent and popular young woman. Yet she was wholly unsatisfied with what her apparently fortunate life seemed to offer. She longed to do something useful and was deeply moved by sympathy for the sick and suffering. At the age of 24, her longings began to crystallize about the thought of becoming a nurse. This idea was bitterly opposed by her family. Eighty years ago nursing (except that done by the religious orders) was looked upon as an occupation for the lowest type of woman.

At last, however, her growing conviction of her mission in life proved strong enough to overcome the power of convention. She studied nursing in Germany and France and, at the age of 34, she was ready for the call of her country in its time of need.

Two seemingly fortuitous events seemed to favor her—the Crimean war and the condition of nursing in hospitals, particularly in those of England, in the first half of the nineteenth century. This period was one in which all social relations were marked by extreme prudery—so much so, in fact, that this attitude had affected even the Sisters of Charity. A series of absurd restrictions were imposed upon them by their religious orders. They were forbidden to perform all sorts of necessary practical bits of nursing on the grounds of impropriety. Consequently, while they retained their serenity and gentleness, they had lost their practical usefulness. The Sisters watched the sick, maintained discipline and system in the hospital, and shed an atmosphere of refinement over the wards. All the actual care of the sick was performed by lay attendants.

Theodor Fliedner (1800-1864), a Lutheran clergyman, settled in Kaiserswerth, Germany; was urged by his wife Friederike to establish a home for deaconesses to visit the sick and poor of the church parishes. These good people already supported a home of reclamation for discharged women criminals and in 1836 they opened the deaconesses' home. Elizabeth Fry, the British prison reformer, visited the Fliedners in 1840 and adopted their system in England. Other countries gradually followed.

Florence Nightingale applied the idea to the British Army medical department when the Crimean war started in 1854, and in the following year, Pirogoff introduced nurses into the Russian Army.

The picture of Florence Nightingale going through the dim wards at night with a lantern led Longfellow to write one of his best-known poems called "The Lady with the Lamp."

In 1856 the Crimean war came to an end and Miss Nightingale returned to England. She decided to select the best of her nurses and secure positions for them in hospitals. But, like all pioneers, she met with opposition from the medical profession. She succeeded in having a fund subscribed to establish the Nightingale School for Nurses at St. Thomas' Hospital in London. The school was opened on June 15, 1860, with fifteen students. This was the first institution of its kind and it has continued to lead the world in nursing progress.

The Nightingale Hospital nursing movement astonished the world. It was so different from anything before experienced, and it proved so successful that other countries rapidly followed in establishing nursing schools.

The leadership of Miss Nightingale—her social rank, her position as a na-

tional heroine, her vision and her dauntless courage—changed the whole conception of nursing, first in England, then throughout the world. Today, we see at some of our leading universities, schools of nursing standing on an independent basis alongside of the schools of medicine and law.

Miss Nightingale has been pictured as a saintly, self-sacrificing, delicate woman who threw aside a life of pleasure to help the afflicted. But this picture is not a true one. She was a strong-minded, determined woman with a gift of caustic sarcasm. Her one great interest in life was to establish the independence of women and to elevate nursing to a dignified profession.

How well she has done this can be judged by a note in the London Times for April 15, 1857, describing the servant nurses of the large hospitals in these words: "They were sworn at by surgeons, bullied by dressers, grumbled at and abused by patients, insulted if old and ill-favored, talked flippantly to if middle-aged and good-humored, and tempted and seduced if young and well-looking." In short they were the worst type of women conceivable for the work of nursing. The hospitals under their care were filthy and vermin ridden, and the wards were scenes of repulsive squalor.

In Europe the seventeenth century was the dark age of nursing, and the care of the sick sank as low as the hospitals in which it was practiced. Conditions were little changed two hundred years later, when Dickens immortalized Sairey Gamp. She, with her pawky umbrella and talk of the hypothetical Mrs. Harris, was a type of the "pudgy, slatternly, dowdy looking female, of drunken and dubious habits" who was the nurse of that day.

We encounter nurses early in Virginia history. In 1612 the hospital at Henricopolis was supplied with "keepers" to attend the sick and wounded. These were probably male nurses. During the rest of the century we find references to both male and female nurses, although male ones were apparently more common. Nursing was at that time indeed a task for men, entailing physical labor that would horrify the modern nurse.

The records of Surry County in 1663 show that Ralph Creed presented a bill for his wife's attendance on a patient "with the comfortablest things a Man in his Condition could expect" and for the "entertainment of those that came to bury him with 3 vollys of shott & diging his grave with the trouble of his funeral included."

The duties of the seventeenth century nurse in Virginia were not to take the temperature, record the pulse, give daily baths, or follow elaborate orders from physicians; but to prepare food, give the "draughts regularly," wash the linen, watch by the bedside, and when death came (as it usually appeared to do when the patient was ill enough to warrant a nurse) to shroud the body and to furnish the entertainment of those who came to the funeral.

There is nothing to show that nursing in Virginia during the eighteenth century surpassed it in the preceding century. It was not a profession at all and did not achieve that distinction for more than a hundred years. It was still the business of slovenly old women. Florence Nightingale once observed that "at one time or another every woman is a nurse." We can be sure that on the women of Virginia homes rested the chief responsibility for the care of the sick—a duty that even the advent of specialized nursing has not entirely lifted.

A new figure did appear during this period—the negro nurse. She was the natural outgrowth of slavery and of the economic and social life of the South. As mammy, midwife, wet nurse or nurse-maid she became a figure of increasing importance. Mammies had large responsibilities in the nursery and often took entire charge of the dosing of the children. Out on the plantation negro nurses had even more responsibility, especially in the larger establishments where they presided over the infirmary and where the care of the small slave children was almost completely committed to them.

IS THERE ANYTHING NEW UNDER THE SUN?

CHAPTER XIV

It is said that a little part of everything in the past survives today. There is not a single development, even the most advanced of contemporary medicine, which is not to be found in embryo in the medicine of the olden time.

In very ancient times professors in luxurious medical colleges were giving lectures to students from all parts of the world. Their extensive knowledge of drugs was handed down to them from a remote antiquity.

These peoples were quite as advanced in their pathological knowledge as in their therapeutics. In dentistry, surgery, and as oculists and specialists in diseases of the eye, and in fevers, they have perhaps rarely been excelled. They were the heirs of many previous great ages, running back hundreds of thousands of years, and, when we study the records of Babylon and contemporary cities, we find that the physicians practiced under an efficient government with an excellent legal code and a good system of education.

No new basis type of disease has been shown to have occurred within geological times; but there is abundant evidence that all the common diseases of animals, plants, and insects are of the greatest antiquity. Wounded animals, plants, and insects appear in remote antiquity. They became infected with bacteria and bacilli precisely as they do today. Links in the chain of life that continue today have always been subject to the same disabilities.

Recent studies of the cave bones discovered in Europe show that fractures were well set, and that many surgical operations were carried out, by the surgeons of the Stone Age, and museum specimens show us that during the early Egyptian dynasties the physicians had a good knowledge of oral surgery and were expert operators.

The Egyptians used many animal remedies, just as we today use testicular, ovarian, liver, adrenal, thyroid and other animal extracts, therefore, the Egyptians are the forerunners of organotherapy.

The story of the medical school of Salerno illustrates very well how old is the new in education—even in medical education. There is scarcely a phase of modern interest in medical education that may not be traced very clearly at Salerno though the school began its career a thousand years ago, and ceased to attract much attention over six hundred years ago.

The Salerno treatment of goitre—the enlargement and over-action of the thyroid gland in the neck—has been improved on only in the details of technique. Medical treatment was always tried first. Today these patients are given small doses of iodine. The Four Masters achieved the same effect by giving ashes of seaweed, which has a high iodine content. If this failed, then resort was had to surgery.

Although blood transfusion was performed as early as the seventeenth century, it was not until the twentieth century that the operation became thoroughly practicable.

Some of the medical aphorisms used centuries before the Christian Era are still applicable:

"Life is short, and the medical art long; the opportunity fleeting, experiment dangerous and judgment difficult. Yet we must be prepared not to do our duty ourselves only, but also patients, attendants, and external circumstances must co-operate.

"For extreme diseases, extreme methods of cure.

"The aged endure fasting most easily; next adults; then young persons, and least of all children, and especially such as are most active and wide-awake.

"Growing bodies contain the most innate heat; they require therefore the most nourishment, and if they lack it they waste away. In the aged there is little heat, and therefore they require little food. Similarly, fevers in the aged are not so acute because they cannot be so well sustained.

"In diseased states sleep that is laborious is a deadly symptom; but when sleep relieves, the indications are good.

"Sleep that puts an end to delirium is also a favorable symptom.

"When a patient eats well, and fails to put on flesh, the symptom is bad.

"Food or drink which is a little less good but more palatable is to be preferred to such that is better but less palatable.

"Old people generally have fewer complaints than the young; but those chronic diseases which do befall them generally never leave them."

The Therapeutic Papyrus mentions many drugs that are in common use today. The ancient Egyptians had an assortment of surgical instruments and the actual cautery were in use, also steam inhalations, massage, ointments, plasters, poultices, suppositories, injections and emetics, and the importance of temperature in disease was to some extent recognized.

Chinese medical authors have been numerous from the most remote periods. Before the Christian Era volumes were written on various branches of medical practice; and the art had been reduced to a sort of system as early as the days of Solomon, or the siege of Troy.

Hippocrates enumerated the names of four hundred substances which physicians prescribed in his time. The bulk of these were handed down to the Greeks from the early Asiatic peoples, and the majority of the effective remedies came from the Near East. Pharmacists at that time were familiar with fomentations, gargles, sprays, pills, lozenges, inhalations, sulphur baths for skin diseases, suppositories, pessaries, poultices, sticking plasters, ointments, cerates, and collyria.

Avicenna, one of the later Arabian savants in medicine, introduced the gilding and silvering of pills to enhance their therapeutic values.

Moses taught two clear conceptions of sanitation—the importance of cleanliness and the possibility of controlling epidemic diseases by isolation and quarantine.

AMERICAN PHARMACY

CHAPTER XV

Pharmacy, or the art of selecting, extracting, preparing, and compounding medicines from vegetable, animal, and mineral substances, is an acquirement which must have been almost as ancient as man himself on the earth. The Greek word, *pharmakeia*, the original of our "pharmacy," had a rather mixed history in its native language. It does not seem to have exactly deteriorated, as words in all languages have a habit of doing, for from the earliest times it was used concurrently to describe the preparation of medicines, and also through its association with drugs and poisons and the production of philtres, as equivalent to sorcery and witchcraft.

The word "*pharmakoi*" in later times came to be used for the criminals who were sacrificed for the benefit of the communities, and thus it acquired its lowest stage of signification. It is remarkable and unusual for a word which has once fallen as this one did to recover its respectable position again.

The aborigines of America, the Aztecs, and the Incas, all had their combination of priest-prophet-physician-pharmacist.

In 1620 the Mayflower at Plymouth included among its passengers an apothecary, Giles Firmin.

The London Company sent two apothecaries to the Virginia Colony before 1624. After that we hear nothing of apothecaries in Virginia until the eighteenth century. Every bit of evidence points to the entire control by physicians of the drug business in the colony.

In the earliest years of the seventeenth century there were several apothecaries in the colony. Thomas Field and Thomas Harford came over with the first settlers, and Fitch and Townshend were apothecaries to John Pott. But by 1621 there was a great scarcity, as the following will show: "It was signified unto the Court that an Apothecary offered to transport himself and his wife at his own charge to Virginia if the Company would please to give them their transport of two children, the one being under the age of eight and the other a youth of good years: which offer the Court did very well like of in respect of the great want of men of his profession, and being put to the question did agree hereunto; provided that the Apothecary at his coming over did exercise his skill and practice in that profession."

In 1646 the first store devoted distinctly to pharmacy in Boston was opened by William Davies.

The first intimation of prescription writing in Virginia in the eighteenth century was William Stark's announcement in Petersburg in 1771 that prescriptions would be made up in his shop "in the most elegant and accurate manner." The practice had probably become more general, at least in the cities, when J. K. Read advertised his new "medicinal store" in Norfolk in 1800, assuring the public that "prescriptions elegantly prepared under his own inspection" would be an important part of the business.

An item in the Virginia Gazette in 1737 gives us our earliest glimpse of the colonial Virginia drug business: "Just imported from London, A Parcel of Choice Medicines; which are to be sold at reasonable Rates, by Wholesale or

Retail, at Mrs. Sullivan's in Williamsburg, by Thomas Goodwin, Chymist." A few weeks later another advertisement appeared: "All Sorts of Chymical and Galenical Medicines, faithfully prepared and Sold by Robert Davidson and Thomas Goodwin, chymists, at Williamsburg."

The first physician to make a practice of writing prescriptions in America was Abraham Chauvet, who came to Philadelphia in 1770. He was followed in that city by John Jones.

A PHARMACIST'S HANDBILL OF 1784

The brothers Whiting sold dry goods, groceries, and pharmaceutical supplies. The final note on the handbill is a commentary on the finance of the period. Cash payment only was accepted, but wood ashes served as tender, as did also many other marketable commodities. The ashes were used in the preparation of soft soap, the alkali being leached out of them.

Benjamin Franklin, born early in the eighteenth century, taking all fields of human endeavor into account, was the most richly endowed of all Americans. Without either wealth or influence, by sheer force of native ability, Franklin became one of the broadest and most versatile characters the world has ever seen.

Franklin had several interesting contacts with pharmacy. He is said to have sold drugs himself for a few years; it is known that as a printer he published a number of articles upon medical and other scientific subjects, and, as will be seen presently when we come to discuss American pharmacy in particular, he had a profound influence upon the development of both pharmacy and medicine by the aid and encouragement he gave to a young man named John Morgan, who later became prominent in both medicine and pharmacy.

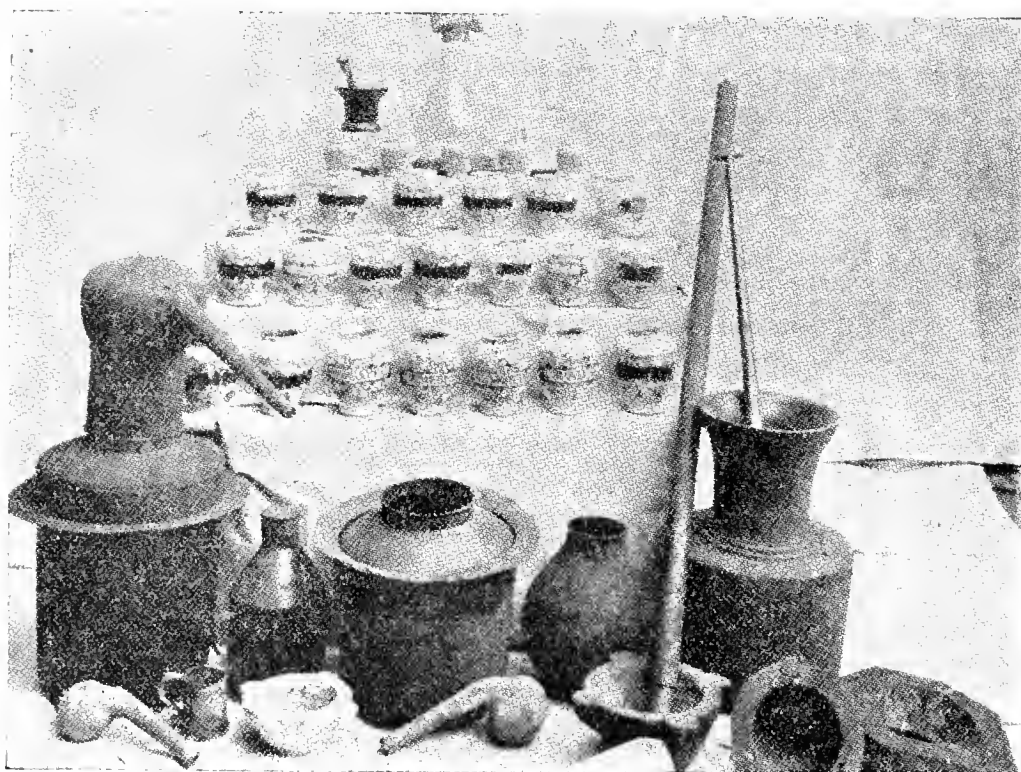
Pharmacy as an independent profession did not receive the support of American physicians until after the Revolutionary War. At the Pennsylvania Hospital in 1754 were written the first prescriptions to be filled by an apothecary in the United States. John Morgan, who as a student in Europe had learned the advantages of the separation of the two professions, wrote: "I am now preparing for America, to see whether after fourteen years' devotion to medicine, I can get my living without turning apothecary or practitioner of surgery."

John Morgan (1735-1789), was born in Philadelphia. When the Pennsylvania Hospital opened its apothecary shop in 1755 Benjamin Franklin appointed Morgan as chief dispenser. Two years later he was graduated with the first class from the College of Philadelphia. After two years' study in Edinburg and Paris he returned to found America's first medical school in Philadelphia College, which later became the University of Pennsylvania. In 1821 the Philadelphia College organized the first college of pharmacy in the new world.

Dr. Morgan is said to have been the first man in Philadelphia to carry a silk umbrella. Dr. Morgan served with George Washington in the French and Indian Wars as lieutenant and surgeon and was Physician-in-Chief of the Revolution Army. He had professional enemies and became the victim of false charges and political abuse. When the war ended and George Wash-

ington had time to review the charges, he exonerated Morgan of neglect or wrongdoing. Congress declared he had conducted himself ably and honestly. But the mischief was done. Morgan retired to private life, a heart-broken, grief-stricken man. He would sit for hours looking at a book without turning a leaf. When his wife died he lost all interest in life.

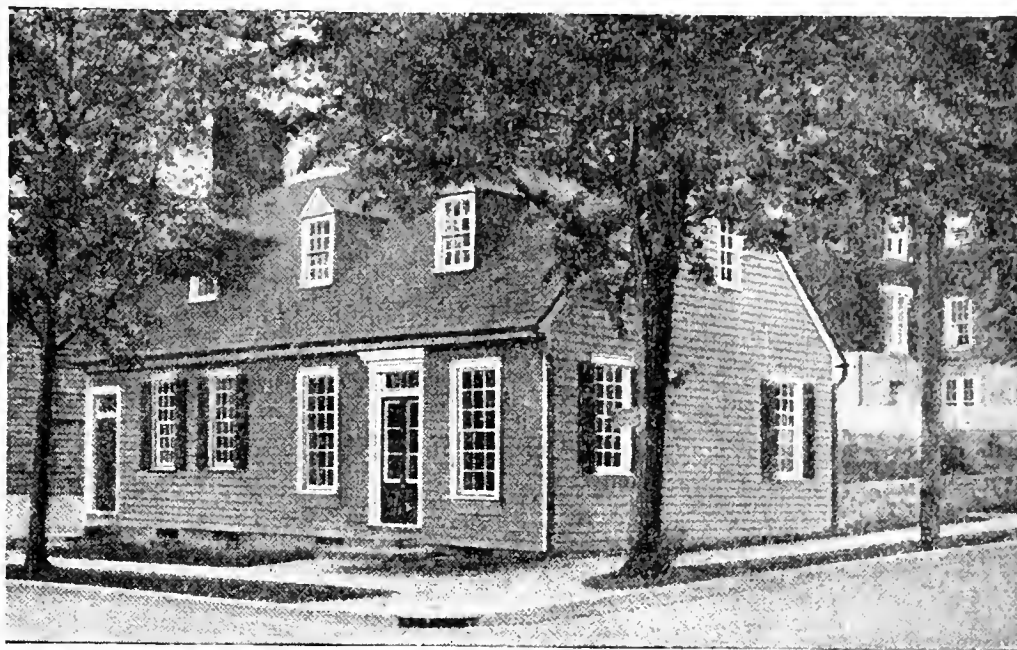
On October 15, 1789, he was found dead in a squalid house, on an untidy bed littered with books and papers.



"AMERICA'S OLDEST PHARMACY"

The oldest pharmacy in America which has been in continuous operation was established in 1743 in the Moravian settlement at Bethlehem, Pennsylvania. "Die Apotheke," as it was early known, was seventh in order of founding, but is the sole survivor of those earlier shops. It was founded by Dr. J. F. Otto and has been operated by various owners up to the present time, now being owned by the R. A. Smith estate.

There is no picture extant of the original building. The picture above represents some of the original apparatus.



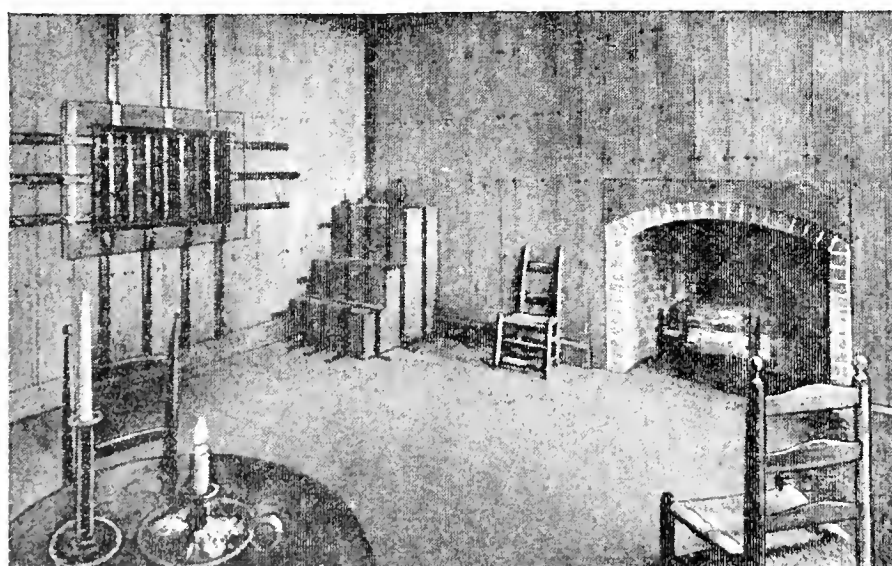
THE GENERAL HUGH MERCER APOTHECARY SHOP
AT FREDERICKSBURG, VIRGINIA,
ERECTED BEFORE 1771

This is not a restoration, but the original building that was used as an apothecary shop, office and dwelling, therefore, it is the oldest pharmacy building in America. The left door opens into the office which was used jointly by George Washington and Dr. Mercer. Washington's boyhood home was at Fredericksburg and he retained a large landed interest there. The building is now used as a museum.

Hugh Mercer (1725-1777), a young surgeon one year out of medical school, was among the Scots who fought in the battle at Culloden in 1745. After this disastrous battle Mercer came to America and settled at Green Castle, the modern Mercersburg. He served as an officer in the French and Indian Wars. At the age of thirty-five he put aside the profession of arms and moved to Fredericksburg, Virginia, where he set up an apothecary shop in a portion of his house and soon became the leading physician of the community. Mercer's fifteen years' residence in Fredericksburg terminated with the outbreak of the Revolution. He again took up the profession of arms. He became a brigadier-general and died Jan. 12, 1777, of wounds received on the 2nd of the same month near Princeton, New Jersey.

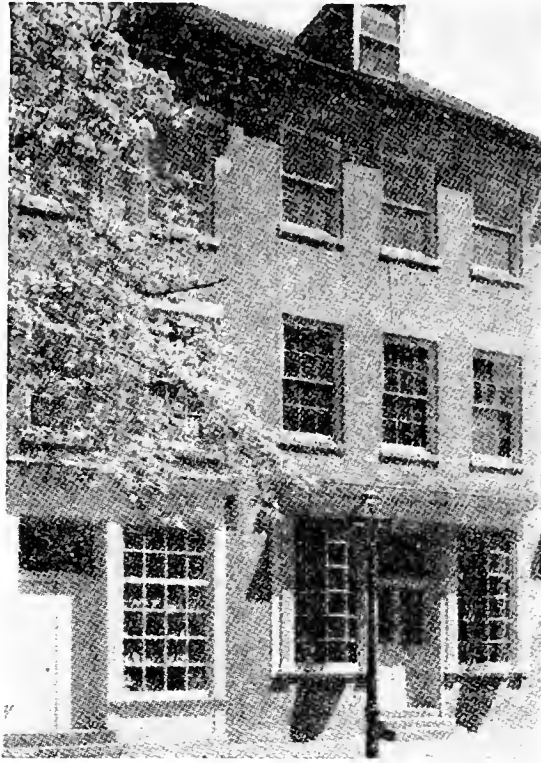


A RESTORATION OF BLAIR'S APOTHECARY SHOP
ERECTED AT WILLIAMSBURG, VIRGINIA,
EARLY IN THE EIGHTEENTH CENTURY



A RESTORATION OF THE GENERAL COURT PRISON
FOR DEBTORS AT WILLIAMSBURG, VIRGINIA

The Gaol was built about 1701 and about ten years later an addition was made containing cells such as these. The commode in the far corner, operated by water, was the first attempt at sanitation in America.



THE STABLER-LEADBETTER APOTHECARY SHOP,
ALEXANDRIA, VIRGINIA

This Apothecary Shop founded in 1792, by Edward Stabler, before being converted into a museum, was the third oldest in America in continuous operation. It was owned and operated by the same family for 141 years. This unique drug shop is almost exactly as it appeared when George Washington, Robert E. Lee and other leading figures of Alexandria and Northern Virginia were regular patrons of this firm.

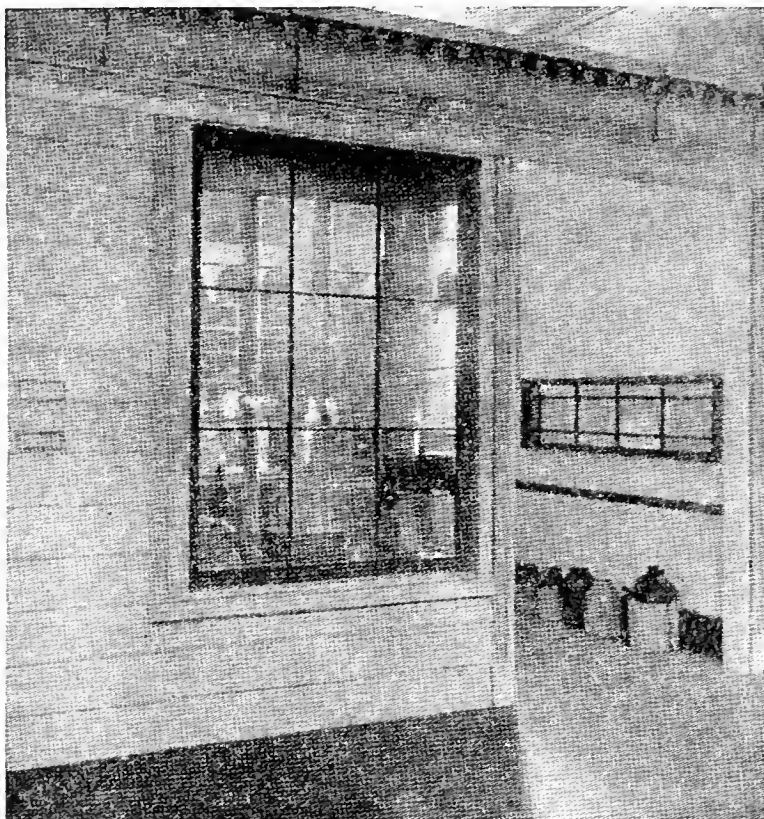
The documentary records retained here are extraordinary. One is from Mount Vernon, April 22, 1802:

"Mrs. Washington desires Mr. Stabler will send by the bearer A quart bottle of his best Castor Oil and the bill for it."

Daniel Webster, Henry Clay, John Calhoun and other early patriots are known to have engaged in the "drug store conversations" in this historic building.

Robert E. Lee was here to get his mail and chat with his friend, Mr. Leadbeater, when J. E. B. Stuart, later chief of cavalry under Lee, handed him the order from the War Department to proceed at once to Harper's Ferry to end the John Brown insurrection. The spot is marked where Lee stood at the time.

This Apothecary Shop, now conducted as a museum, is replete with a stock of ancient wares used by early Americans, including three items of the original order of 1792.



EXTERIOR OF APOTHECARIES' HALL AS INSTALLED
IN THE CHARLESTON, S. C., MUSEUM IN 1921

The museum presents the original room's proportions (17 x 17 ft.), which was the corner room of a private house in 1780. Nothing remains certainly identified as from the founder's time beyond the bits of antique chairboard and cornice. Otherwise the interior woodwork goes back to 1816. The golden mortar and pestle (called by some, "De Big Yalluh Bucket"), which was raised in 1838, still hangs over the door of "Schwettmann's."

Apothecaries' Hall was founded in 1780 by Dr. Andrew Turnbull and has been in continuous operation since that time, being the second oldest drug store in America.

Dr. Turnbull was born and educated in Scotland, settled in Asia Minor, and became a distinguished medical practitioner. He married a wealthy Greek merchant's daughter, and with others planted a colony of Greeks and Minorcans at New Smyrna, Florida. There was an insurrection and armed strife among the Minorcans at the outbreak of the Revolution. Dr. Turnbull lost everything.

In May, 1781, during the British occupation, he came from St. Augustine to Charleston with his family, which was large, and a few servants, in great distress. But by his attainments and talent he soon rose to the front of his profession, and engaged in the business of a dispensing physician, prescribing, preparing, and dispensing medicines. Having taken no part on either side but to heal the sick, and having, during the early imprisonment of the Charles-

ton exiles in St. Augustine, been enabled to show much kindness to their distress, he remained, unquestioned, a citizen at the close of the Revolution. He was one of the founders and charter-members of the Medical Society of South Carolina, was esteemed and respected by all who knew him, a kindly, friendly, courteous gentleman.

Apothecaries' Hall has been owned by a continuous line of prominent druggists. Much of interest in regard to this notable drug store may be found in the Charleston Museum.



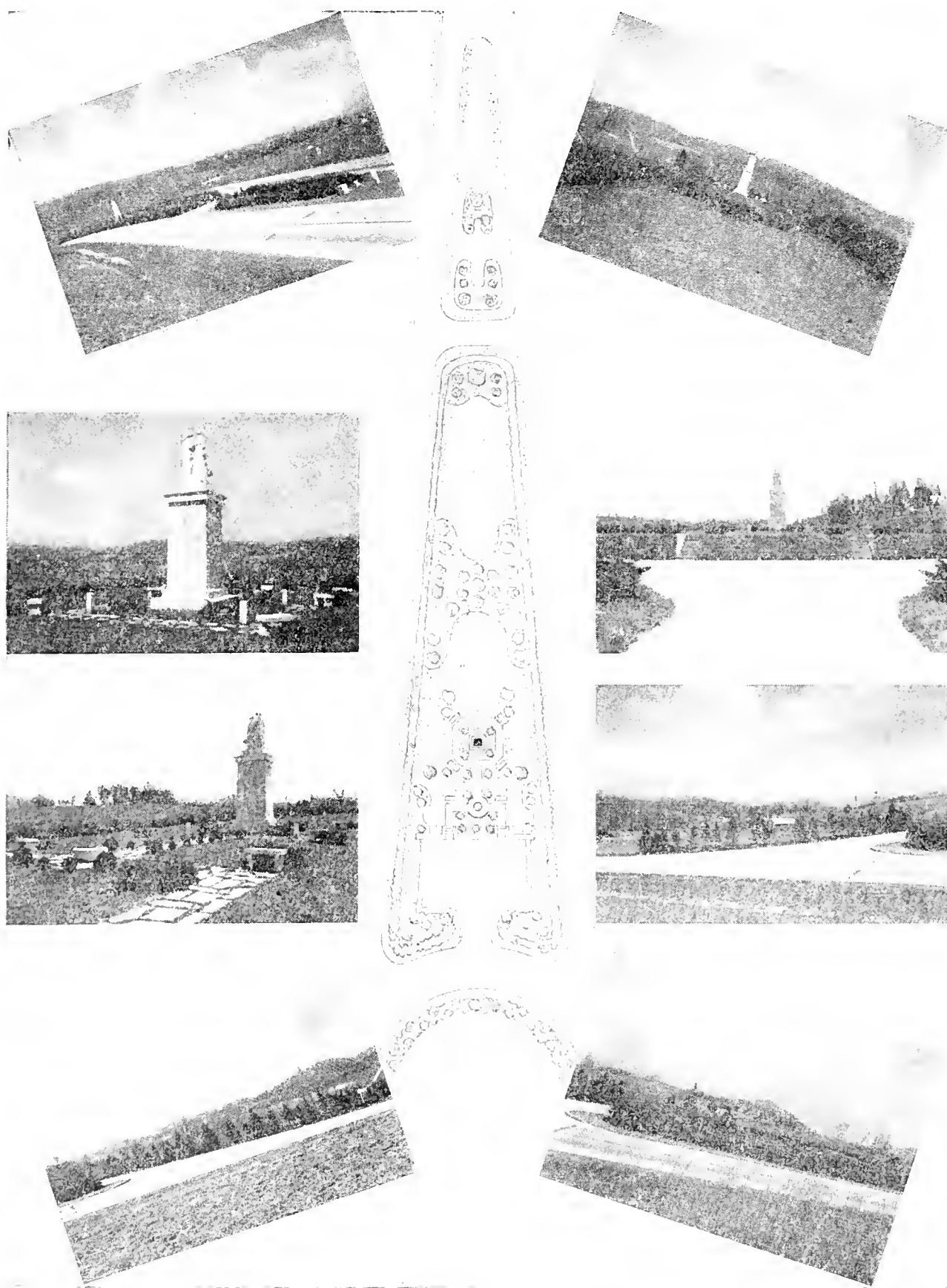
A RESTORATION OF THE 1769 APOTHECARY SHOP OF DR. CORBIN GRIFFIN, YORKTOWN, VIRGINIA

Dr. Griffin, a physician, had studied at the University of Edinburg in 1765 and was a man of culture and learning, not confining his lore, as was the custom of the day, to "blood-letting, colomel and cathartics." Dr. Griffin was an ardent patriot during the Revolution and served as a surgeon in the Virginia line.

The addition to the building was added recently and the building is now used as the post-office at Yorktown.

A SKETCH OF MEDICINE AND PHARMACY

THE BACKGROUND OF THE S. E. MASSENGILL FAMILY



THE MASSENGILL FAMILY MEMORIAL



ERECTED TO THE MEMORY OF
HENRY MASSENGILL
AND HIS PIONEER FAMILY

CAME FROM NORTH CAROLINA TO THE WATAUGA
SETTLEMENT IN 1769. HIS PLANTATION NEAR THE
MOUTH OF BOONES CREEK ADJOINED WILLIAM
BEAN'S, WHO WAS THE FIRST PERMANENT
WHITE SETTLER WEST OF THE
ALLEGHANY MOUNTAINS.

IN 1775 WAS APPOINTED TO AN OFFICE IN THE
WATAUGA ASSOCIATION WHICH ADOPTED
THE FIRST WRITTEN CONSTITUTION
FOR THE GOVERNMENT OF
AMERICAN-BORN
FREEMEN.

BUILT THE MASSENGILL HOUSE OF WORSHIP 1777
SERVED TWO YEARS AS SHERIFF OF WASHINGTON
DISTRICT. IN 1778 WAS CHAIRMAN OF
THE COMMITTEE OF SAFETY.

SERVED ON THE STAFF OF CAPTAIN WILLIAM
EDMISTON IN GENERAL SHELBY'S
EXPEDITION AGAINST THE
CHICKAMAUGA INDIANS
IN 1794.

FURNISHED THREE SONS TO
THE REVOLUTIONARY
ARMY.

THE MASSENGILL FAMILY MEMORIAL

AMERICAN PHARMACY

EXTRACTS FROM THE MASSENGILL MEMORIAL ERECTED BY SAMUEL EVANS MASSENGILL

Erected to the memory of Henry Massengill and his Pioneer Family.

Came from North Carolina to the Watauga settlement in 1769. His plantation near the mouth of Boone's Creek adjoined William Bean's, who was the first permanent white settler west of the Alleghany Mountains.

In 1775 was appointed to an office in the Watauga Association which adopted the first written constitution for the government of American-born freemen.

Built the Massengill House of Worship, 1777. Served two years as sheriff of Washington District. In 1778 was chairman of the committee of safety.

Served on the staff of Captain William Edmiston in General Shelby's Expedition against the Chicamauga Indians in 1779.

Furnished three sons to the Revolutionary Army.

THE MASSENGILL HOUSE OF WORSHIP

From the memoir of Henry Massengill:

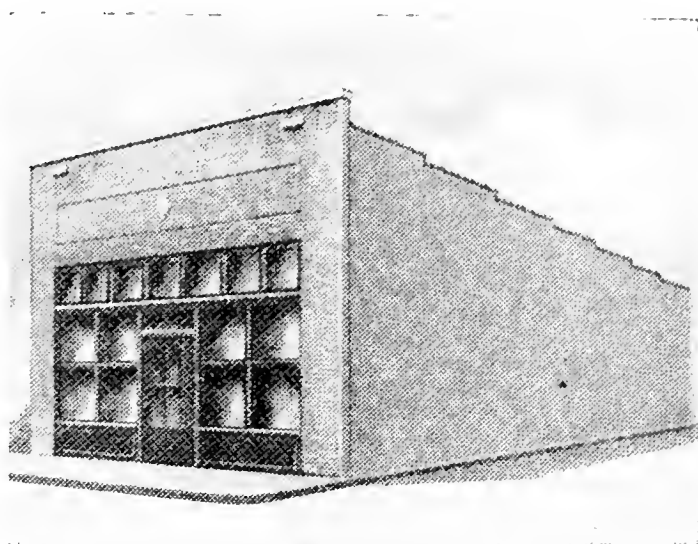
"In April, 1777, Rev. Charles Cummings, a Presbyterian minister from Wolf Hills Settlement, came to Watauga and preached three days. We hailed his coming among us with great joy, for our souls were hungering and thirsting for spiritual nourishment. He urged the settlers to build a House of Worship, which we decided to do. I was to furnish logs, boards and all timbers needed to build a large house, with a section of benches in the back side for the Massengill and Cobb negroes, numbering at this time 151 souls. So these slaves can come out and be refreshed in body and soul. This house was completed by July, 1777, and was known as the Massengill House of Worship. Revs. Cummings and Mulkey preached several times to the settlers. I marched with Shelby against the Indians in 1779. While I was away Tories came, abused my family, destroyed my property, burnt the Massengill House of Worship to the ground."

William Cobb, a brother-in-law of Henry Massengill, closely followed him to the Watauga settlement. His residence, in connection with the surrounding forest, was used by Governor Blount in 1790, as the first capitol of a recognized government west of the Alleghany mountains.

From Ramsey's Annals of Tennessee:

"Mr. Cobb was a wealthy farmer, an emigrant from North Carolina. No stranger to comfort and taste nor unaccustomed to what for the day was style. Like the old Virginia and Carolina gentlemen he entertained elegantly with profusion rather than with plenty without ceremony and without grudging. Like theirs, his house was plain, convenient without show. His equipage was simple and unpretending. He kept his horses, his dogs, his rifles, and even traps for the use, convenience and comfort of his guests. His servants, his rooms, his grounds were all at their bidding. They felt themselves at home and never said adieu to him or his family without the parting regret and the tenderness of an old friendship."

"Andrew Jackson, 7th President of the United States, was related to William Cobb's wife, and in 1788, while awaiting his license to practice law in Washington County, stayed at the William Cobb residence for six weeks and spent the time hunting and fishing."



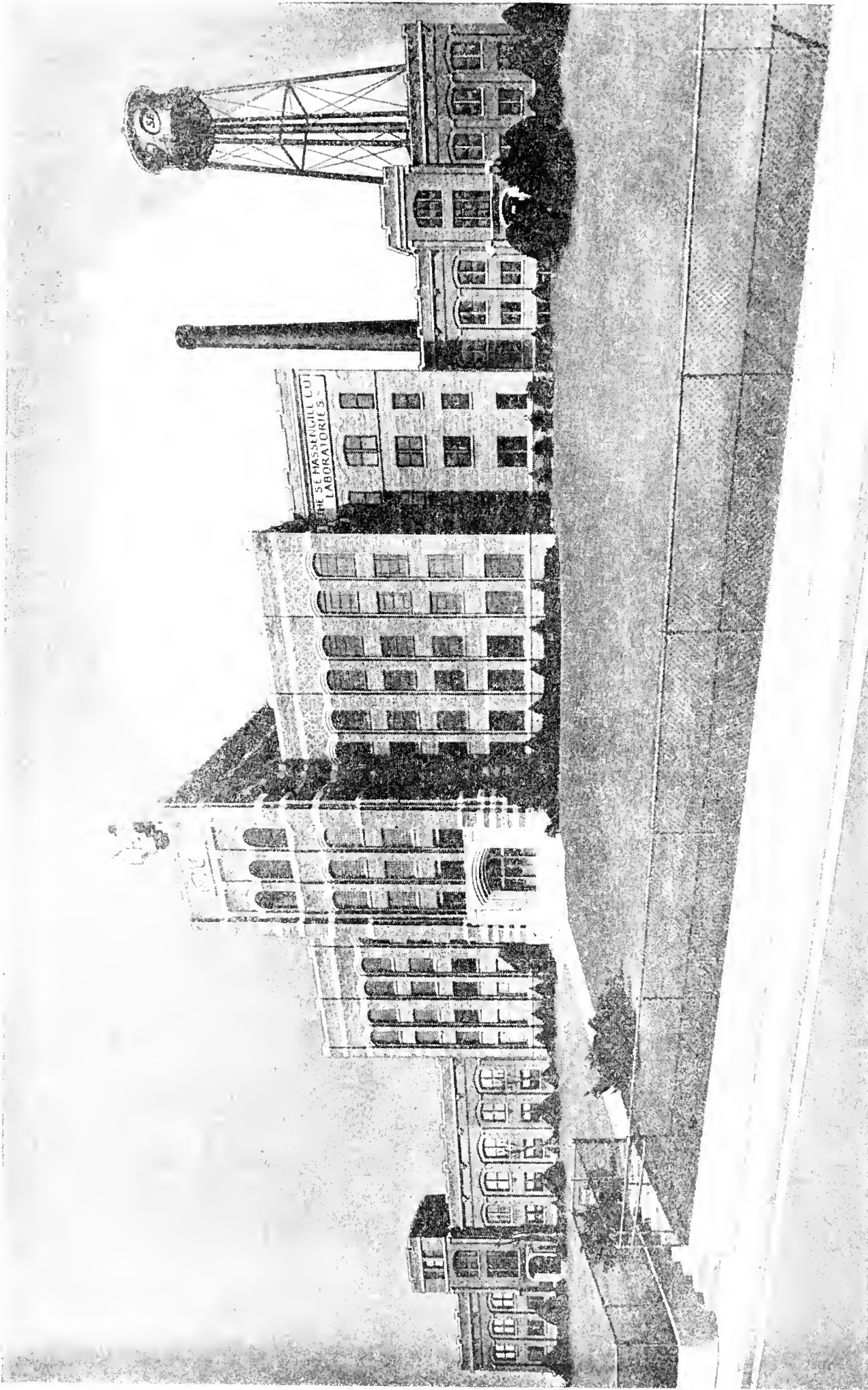
THE FIRST LABORATORY OF THE S. E. MASSENGILL
COMPANY, BRISTOL, VIRGINIA, 1899



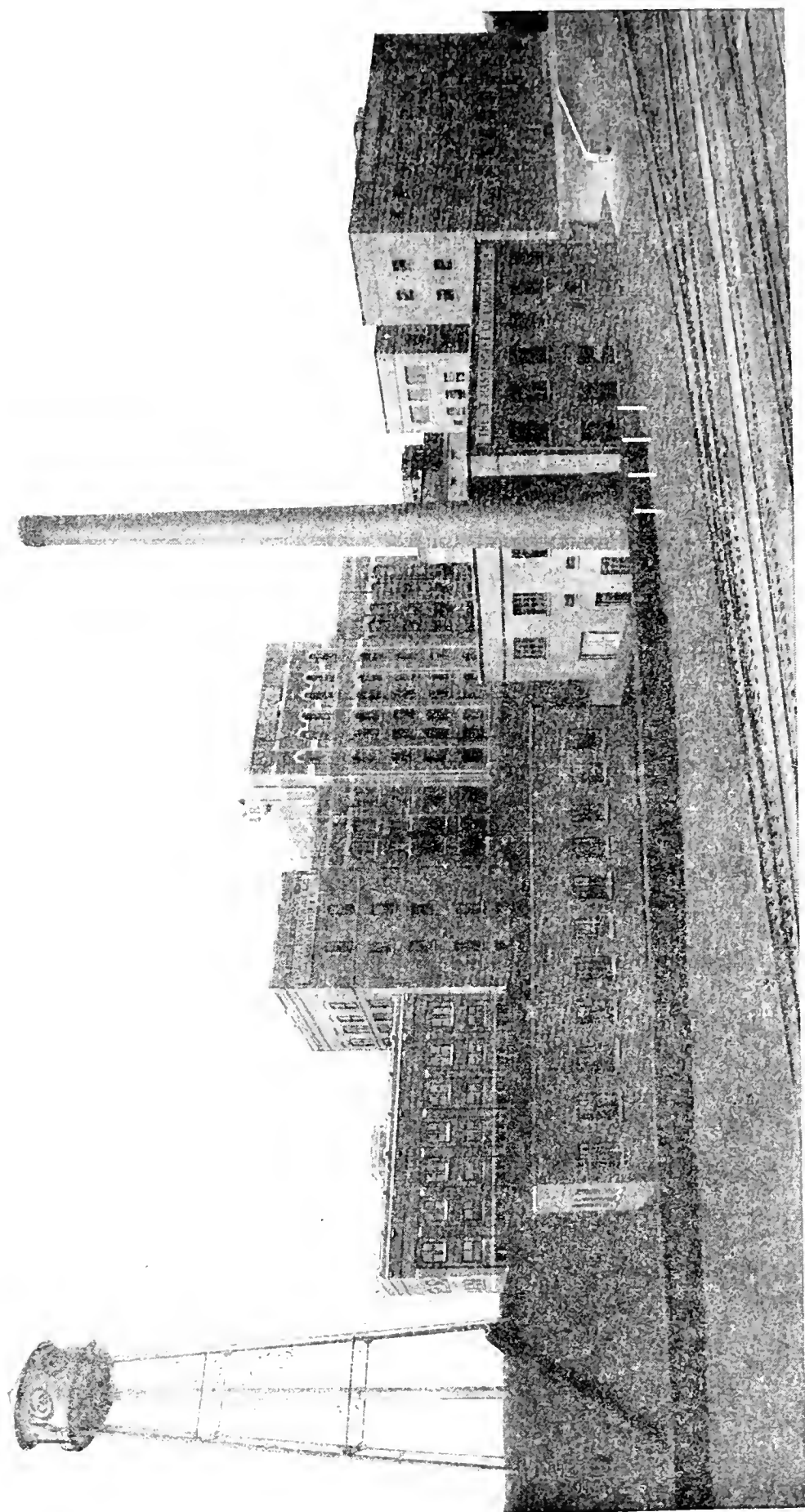
NORMAN HOOD MASSENGILL (1869-1926)

SAMUEL EVANS MASSENGILL, M. D.

FOUNDERS OF THE S. E. MASSENGILL COMPANY



FRONT VIEW OF THE S. E. MASSENGILL COMPANY'S LABORATORIES, BRISTOL, TENNESSEE

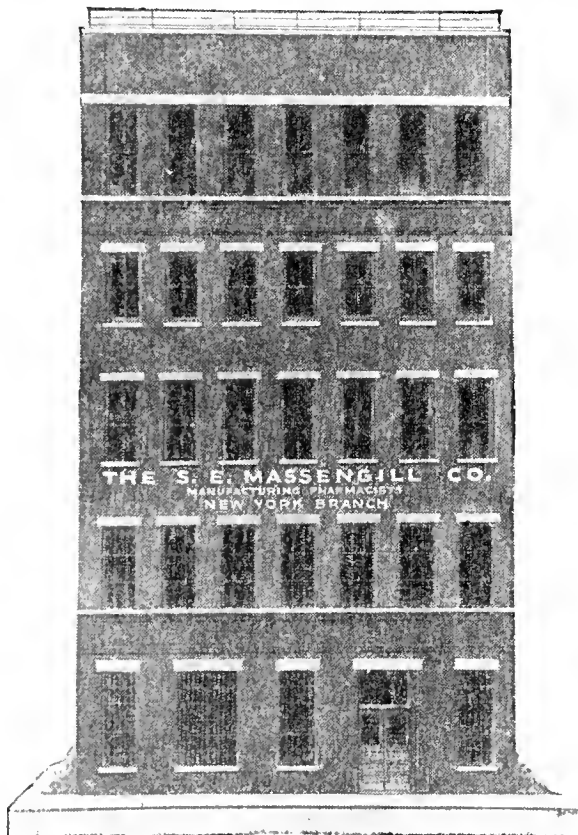


REAR VIEW OF THE S. E. MASSENGILL COMPANY'S LABORATORIES, BRISTOL, TENNESSEE

A SKETCH OF MEDICINE AND PHARMACY

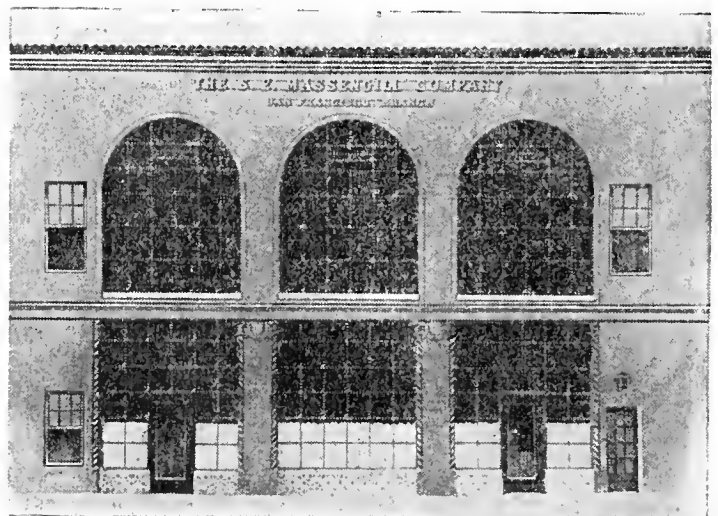


Kansas City Branch of THE
S. E. MASSENGILL COMPANY,
located at 208-214 W. Nine-
teenth Street, Kansas City, Mo.



ABOVE: New York Branch of THE
S. E. MASSENGILL COMPANY, located
at 59-61 Barrow Street, New York,
N. Y.

AT RIGHT: San Francisco Branch
of THE S. E. MASSENGILL COMPANY,
located at 240-244 Fourth Street, San
Francisco, California.



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Maccengill, Samuel Evans
A sketch of medicine
and pharmacy

Pharmacy

